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In the Supreme Court of the United States.

OCTOBER TERM, 1923.

ELECTRIC BOAT COMPANY, APPELLANT,
v.
THE UNITED STATES. } No. 159.

CHRONOLOGICAL SYNOPSIS OF PRINCIPAL POINTS OF THE FINDINGS OF FACT.

(Dates referring to activities of Davison and of Electric Boat Company in italics, to activities of E. W. Bliss Company in bold-face type.)

August 17, 1905.

De Ferranti British patent 9496 of 1904 (Exhibit C 5) published (Finding XIV, p. 22) with complete exposition of operating a torpedo power plant by burning all possible fuel with air or oxygen and injecting water both to cool the products of combustion and to add to their volume by producing steam.

November 6, 1906.

Sodeau United States patent 835262 (Exhibit C 7) granted (Finding XIV, p. 22) disclosing feeding liquid into the combustion chamber of the superheater of a torpedo power plant by displacing it by a portion of the compressed air under a differential in pressure.

January 1, 1908.

Mr. Davison resigns from the Navy and enters employ of plaintiff. (Finding III, p. 9.)

January, 1908.

Article in "Revista Maritima Brasileira" (Exhibit C 14, p. 22) published, describing power plant of Gesztesy torpedo, "which power plant provides for the generation and use of steam in combination with compressed air and the gases of combustion for motive power." (Finding V, first paragraph, p. 10.)

Jan. 27, 1908.

Sodeau United States patent application which resulted in United States patent 964574 (Exhibit C 11), equivalent to British patent 6081 of 1907 mentioned below (Exhibit C 10) filed. (Finding XIV, p. 22.) This patent describes the plan of construction of the torpedoes complained of in this suit.

March, 1908.

Bureau of Ordnance receives Revista article. (Finding V, first paragraph, p. 10.)

March 26, 1908.

Bureau of Ordnance forwards Revista article to E. W. Bliss Company. (Finding V, 2nd paragraph, p. 10.)

April 4, 1908.

The Bliss company returns Revista article and states that it had for some time "had plans on the same general principle as that shown" and that it intends at as early a date as possible to make certain tests of it. (Finding V, 2nd paragraph, p. 10.)

April 17, 1908.

Bureau of Ordnance request that the Bliss Company inform it of any experiments which the Bliss Company might make with superheater of Gesztesy type. (Finding V, 3rd paragraph, p. 10.)

April 23, 1908.

Sodeau British patent 6081 of 1907 (Exhibit C 10) published (Finding XIV, p. 22), showing torpedo power plant with both water and fuel injected into the combustion chamber by displacing them by portions of the compressed air under a differential in pressure. This patent describes the plan of construction of the torpedoes complained of in this suit.

June 9, 1908.

The Bliss company replies to Bureau's letter of April 17, 1908, stating that it had as yet made no progress with experiments as its testing facilities were so fully occupied with torpedoes under way for the Bureau that it could not then conduct any outside experiments and that it would report to the Bureau the result of any experiments it should make. (Finding V, 3rd paragraph, p. 10.)

December 19, 1908.

Gesztesy French patent 393,324 (Exhibit C 13) published (Finding XIV), this patent being for the power plant of the Gesztesy torpedo described in the Revista article (Exhibit C 14) referred to above. (Finding V, first paragraph, p. 10.) The corresponding British patent 18,241 of 1908 (Exhibit C 12) was published March 3, 1909.

1909.

Navy obtains torpedoes with outside superheater type of power plant. (Finding IV, p. 9.)

March 29, 1909.

Application for patent in suit filed. (Finding II, p. 8.) This application was not seen by the Bureau of Ordnance prior to the date of the contract in suit, April 2, 1912. (Finding X, last paragraph, p. 20.)

November, 1909.

Bureau of Ordnance commences experiments at Naval Torpedo Station at Newport for increasing the motive power and range of torpedoes by the use of steam generated by the injection of water into the combustion chamber where the steam was combined with the compressed air and gases of combustion. (Finding V, 4th paragraph, pp. 10-11.)

June, 1910.

Bureau of Ordnance receives comprehensive written report on work at Naval Torpedo Station at Newport. (Finding V, 4th paragraph, pp. 10-11).

1910.

Verbal information received by the Bureau of Ordnance from the Bliss Company with reference to experiments by the company along the same lines. (Finding V, next to last paragraph, p. 11.)

July 26, 1910.

Commander Norton, the Bureau of Ordnance officer in charge of torpedo work, visits plaintiff's plant for the purpose of inspecting air compressors

and gyroscopic control gear. Told by Davison the progress of experimental work, but not shown any of the component parts of the apparatus used. Norton requested Davison to *take up* the matter again. (Finding VI, p. 11.)

August 8, 1910.

Electric Boat Company proposes that Government enter comprehensive license agreement, to be contingent on, but obligatory after, a successful demonstration, the proposed license involving a cost-plus basis of manufacture, an initial payment of \$100,000 and large royalties. (Finding VII, p. 12.) This proposition was not accepted but instead—
September 6, 1910.

The Bureau of Ordnance, with a view to determining the merits of the different motive-power systems, addresses substantially similar letters to E. W. Bliss Company and to Electric Boat Company inviting proposals for making experimental torpedoes, each company being informed that the torpedo constructed by it would be placed in competition with a torpedo to be submitted by another firm and with torpedoes being developed by the Bureau itself. (Finding VIII, first paragraph, p. 13.)

October 14, 1910.

Bliss Company in letter to Bureau refers to tests already made by injecting water giving practically double the amount of work previously obtained. (Finding V, last two paragraphs, p. 11.)

January 17 and 23, 1911.

Contracts with Electric Boat Company for experimental torpedoes of 18 and 21 inch sizes executed. (Finding VIII, first paragraph, p. 13.)

February 16, 1911.

Contracts with Bliss Company for experimental torpedoes of 18 and 21 inch sizes executed. (Finding VIII, p. 13.)

August, 1911.

Bliss 21-inch torpedo, a "practical duplicate" of those complained of in this suit (Finding XIII, 3rd paragraph, p. 22) completed (Finding VIII, 2nd paragraph, p. 14), tested in the fall, accepted and paid for on the basis of having obtained a range of 10,000 yards, the contract providing for a bonus for excess performance above the 4,000-yard run. (Finding VIII, first two paragraphs, pp. 13-14.)

September 24, 1911.

Government has Bliss 21-inch torpedo on testing range at Sag Harbor and torpedo had made run of over 9,500 yards. (Finding IX, last paragraph, p. 16.)

October 20, 1911.

Electric Boat Company submits drawing of device of form and character shown in Exhibit I (Finding XI, first and last paragraphs, pp. 20-21) to be applied to existing Whitehead torpedoes to double their range with proposition for royalty to be paid "on all torpedoes fitted with this device in the future." (Finding IX, p. 14.) At this time the Government

possessed a large number of Whitehead torpedoes of 4,000 yards and under range. (Finding IX, first paragraph on p. 15.)

October 23, 1911.

Bureau of Ordnance forwards Electric Boat Company's letter to torpedo station for comment. (Finding IX, p. 15.)

October 26, 1911.

Commander Williams, in charge of torpedo station, recommends that Electric Boat Company's proposition be not accepted since the Bliss Company's torpedo, a "practical duplicate" of those complained of in this suit (Finding XIII, 3rd paragraph, p. 22), with a superheater in which was injected water, was already in the water and the torpedo station itself and foreign companies were working with a superheater in which water was injected. (Finding IX, p. 15.) The Bliss Company torpedo had as early as Sept. 24, 1911, run 9,500 yards. (Finding IX, p. 16.)

November 2, 1911.

Replying to torpedo station, Bureau of Ordnance indorses on Electric Boat Company's letter of October 20th that Electric Boat Company's proposition is to replace superheater in old torpedoes with Davison steam generator, that "the Bureau is given to understand this generator is not in any sense a superheater" and "is not to conflict with present superheater rights." (Finding IX, pp. 15-16.)

November 4, 1911.

Commander Williams recommends that no contract be entered into until "it is clearly established that this device is different from other patented devices of the same nature" but recommends loaning torpedoes to Electric Boat Company in order that this device may be installed therein for test. (Finding IX, p. 16.)

November 9, 1911.

Bureau of Ordnance answers Electric Boat Company's letter of Oct. 10, 1911, proposing royalty "for all torpedoes converted" and fixes 6,000 yards as minimum performance. (Finding X, p. 16.)

December 6, 1911.

Electric Boat Company answers Bureau's letter of Nov. 9, 1911, royalty to apply "not only to torpedoes which may hereafter be converted but also to torpedoes which the Government may build at its own works and in which the *device in question* is to be used." (Finding X, pp. 17-18.)

December 13, 1911.

Bureau of Ordnance makes requisition for two Whitehead torpedoes to be converted by Electric Boat Company and at the same time forwards Electric Boat Company blank shop license in which Electric Boat Company is to insert the numbers of patent applications. (Finding X, p. 18.) The patent applications were not seen by the Bureau. (Finding X, last paragraph, p. 20.)

January 18, 1912.

Bureau of Ordnance preparing contract for fifty Bliss torpedoes having power plants like the 21-inch Bliss torpedo (Finding VIII, 3rd paragraph, p. 14), a practical duplicate of those complained of in this suit. (Finding XIII, 3rd paragraph, p. 22.)

April 2, 1912.

Contract in suit executed. (Finding X, p. 19.) This is essentially the blank shop license forwarded Dec. 13, 1911, with the numbers of the patent applications inserted by the Electric Boat Company. The patent applications were not seen by the Bureau of Ordnance prior to the execution of the agreement. (Finding X, last paragraph, p. 20.)

May 15, 1912.

Bliss Company's second experimental torpedo (18-inch size) formally accepted by the Government after exceeding contract requirements. (Finding VIII, 2nd paragraph, p. 14.)

June, 1912.

Government lets contracts to the Bliss Company for manufacture of 290 torpedoes having power plants similar to the 21-inch torpedo (Finding VIII, paragraph 3, p. 14), a practical duplicate of those complained of in this suit (Finding XIII, paragraph 3, p. 22), the torpedo which as early as Sept. 24, 1911, made a run of over 9,500 yards on Government testing range at Sag Harbor (Finding IX, last paragraph, p. 16).

August 20, 1912.

Patent in suit 1,036,080 is granted. (Finding XII, p. 21.)

October, 1912.

Electric Boat Company completes 18-inch torpedo under contracts of Jan. 17 and 29, but this torpedo never met the minimum requirement of the contract for the range of 4,000 yards. The 21-inch torpedo was never completed. (Finding VIII, last paragraph, p. 14.)

November, 1912.

Converted Whiteheads completed and sent to torpedo station by Electric Boat Company for test. (Finding XI, p. 20.)

September 27, 1913.

After a long period of experiments at the torpedo station one of the converted Whiteheads exceeded on one occasion the minimum run of 6,000 yards, a 50% increase over their original range, required for acceptance, and the Naval Torpedo Board reports that "the reliability of this form of steam generator has not been established and * * * there are grave doubts as to the practicability of this device as at present fitted for service use" and recommends "that no steps be taken toward the conversion of service Whitehead torpedoes into steam torpedoes of this modification." (Finding XI, p. 20.)

October 6, 1913.

Bureau of Ordnance approves company's bill of \$3,000 for the conversion of two Whitehead torpedoes, which bill was thereafter paid. (Finding XI, p. 20.)

June 16, 1914.

Electric Boat Company's contracts of Jan. 17 and 29, 1911, for experimental torpedoes cancelled at said company's request without penalty. The 21-inch torpedo had never been completed and the 18-inch torpedo failed to meet the minimum requirement of the contract for a range of 4,000 yards and was therefore not accepted by the Government. (Finding VIII, 4th paragraph, p. 14.)

BRIEF FOR DEFENDANT.

May it please the Court:

ERRORS IN APPELLANT'S STATEMENT OF FACTS OF THE CASE.

The brief filed for appellant abounds in statements which either find no basis at all in the record, but represent appellant's idea of what the evidence to support his contentions should be, or else are unwarranted by the Findings of Fact on the subjects referred to. These statements are so numerous and so glaring that we can not entirely pass them by. We refer to them here before proceeding to our own statement of the case lest we seem to assent to their correctness, but a clear understanding of their inaccurate and misleading character can be had only from the fuller treatment of facts in the main body of our brief. We mention only a few and will not attempt to treat them in logical order, but simply one after another as they may be noted by a cursory glance through the brief.

In the beginning, on page 2, there is a statement that in the Davison form of power plant the motive fluid supplied to the engine "consists largely of steam." This has no foundation in the record and is denied. It is simply an attempt to call all the present types of torpedoes "Steam Generators" and to try to bring them within the purview of the peculiar trade name which, at the time of the contract in

suit, was applied to Davison's particular device, and to that alone. Connected with this is the attempt to show that Davison was the first to conceive of burning all the oxygen in the air tank of the torpedo. On page 19 we are told that he "discovered" that not all the oxygen was burned in the outside superheater—a discovery of something which everyone knew—and on page 20 that he "reasoned from this" that greater power could be obtained by utilizing all the oxygen. This also everyone knew, and De Fer-ranti had not only pointed out the fact in his patent published in 1905 but pointed out that the way to attain the desired results was to introduce water so as to make the heat units effective by the production of a larger volume of motive fluid at a lower temperature (see in this brief, p. 98 ff.). That there is no credit due to Mr. Davison for any idea of this kind may be clearly seen from the fact that in the patent in suit no single word is said about burning all the oxygen of the air, although that is held up again and again throughout the brief as a paramount feature of Davison's alleged invention.

Throughout the brief, particularly on pages 3 and 21, we are told that Davison's was the first torpedo mechanism making use of steam, and that his invention changed failure into success. The Bliss torpedo, built on the plan of the Sodeau patents, was successfully running in September, 1911. (Finding IX, p. 16, last paragraph.) Of four torpedoes constructed by Mr. Davison three were complete failures, and one

on a single occasion showed a moderate increase in range, but was estimated as a failure by the report of the Torpedo Board which considered its merits. The single successful run was at some time after November, 1912. (Finding VIII, p. 14, last paragraph and Finding XI, p. 20.) Evidently appellant feels it necessary to apologize for the performance of its one torpedo, because we are told (brief, pp. 15-16), without warrant in the record, how much further it would have gone if the engine had been a new one. We may point out that the torpedo which Davison built with a new engine never attained even the minimum range. (Finding VIII, p. 14.)

In many instances through the record, pages 4, 23, 85, 86, and 90, it is said that the Navy abandoned its own experiments on water injection because they could not discover a successful way to introduce the water. This statement is incorrect. As the report of the Navy's experiments reproduced on page 11 of record states, the effort was made "to produce a torpedo better than the best for present needs," and that "until there is produced a torpedo entirely reliable in all those functions of the details which have *nothing to do with the heater*, it is proposed to use seventy-five per cent alcohol and no injection of water." The work was not abandoned. The emphasis was for a time shifted, but the letter quoted on page 15 of the record shows that in 1911 the work had been taken up again and was near completion, when the complete success of the Bliss torpedo rendered further

development unnecessary. In this same connection it is interesting to note that Davison himself never devised any method of injecting water which was practical for use, much less the "best" method.

The situation of the Navy Department at the time of the contract is misrepresented throughout the brief, both by unwarranted statements as to facts and by statements contrary to the record. Perhaps the most flagrant example is the scandalous statement on page 87 that Naval officers violated professional confidence and carried information of Davison's work directly to the Bliss Company. The court would be well warranted in striking from the record such a statement. Not only has it no foundation in the record, but we show elsewhere (p. 127) that the facts of the record refute it. The allegations on pages 5, 56, and 57 that the Navy entered into the contract to protect it in the use of the Bliss invention, knowing that Davison's patent covered it, are refuted on pages 63-68 of this brief. These allegations are supported in appellant's brief by unwarranted statements. For instance, on page 64 it is stated that the Navy knew of Davison's invention. As a matter of fact, as Finding VI shows, the officers of the Navy knew none of the details of what Davison had done. It is stated on page 3 that Davison kept in touch with his former associates of the Navy and that they were "constantly informed of the progress of his work." No finding substantiates this.

On page 57, after reciting that the Navy Department contracted with the E. W. Bliss Company and the plaintiff company for the manufacture of "experimental torpedoes" appellant goes on to say: "Appellant's torpedo, as we have stated above, attained a range of 6,000 yards, 50 per cent greater than the previous superheater torpedoes." This is false. Appellant's experimental torpedo was a flat failure and was unable to reach even the minimum range of 4,000 yards. (Finding XIV, p. 14.) It was a Whitehead torpedo, one of two reconstructed by appellant under an entirely different contract, which years later "after a long period of experiments" made "on one occasion" a run of 6,000 yards. (Finding XI, p. 21.) This single solitary run of a lone torpedo only emphasizes the otherwise consistent failure which attended appellant's efforts.

On page 84 reference is made to drawings as "showing Davison's priority." If they had, the Court might have included a reference to such priority, or at least to such drawings, in its Findings. They are not referred to in the present record and should not be referred to in the brief.

The entire discussion of the history of torpedoes, of the patented device, and of the patents of the prior art abounds in statements, many of which find no foundation in the record, which are properly matters of expert opinion and many of which we can not accept. It is possible to refer only to examples. For instance: On page 33 the entire theory of how a differential pressure is created in the Davison tor-

pedo is something outside of the patent itself and outside the findings of fact. On page 92 the statement that Davison carries some water in his torpedo is not warranted by the patent, and seems, in fact, contrary to the disclosure. The theory of operation set forth on page 22, the discussion of Sodeau patents on pages 69ff, and of the Gesztesy device on pages 78ff are further instances of *ex parte* expert argument, having no foundation in the record. The theory with respect to the Sodeau patent, 6081 of 1907, and with respect to Gesztesy, that no increase in energy was contemplated, is an absurd argument. There was no need for the patentee, Sodeau, to state that he could burn all the oxygen in the air. That was an old idea and had been disclosed by De Ferranti. He did say that he would increase the volume of working fluid passing to the engine. (Addition to Rec. p. 50.) The appellant's statement that he merely designed to cool the gases of combustion for the mere sake of cooling is silly. Energy is a function of temperature and volume. The only reason for cooling is when the temperature is excessive. Water may be added to cool and the volume increased with a greater energy than would be possible at the lower nonexcessive temperature which would otherwise be possible. The finding of the court below that the defendant does not use the Davison device, and the statement in its opinion that Sodeau and the other patents disclose steam generators sufficiently indicate that it considered

any conflicting testimony on these points of thermodynamics and resolved them against the contentions which appellant now again advances in his brief without any warrant therefor in the record before this court. The fact is that the Government utilizes the thermo-dynamic theory of De Ferranti and the apparatus of Sodeau and has a long-range torpedo. Davison utilized the theory of De Ferranti and his own patented apparatus and the result was a failure.

Another instance where the theoretical contentions of appellant in the Court below are advanced here without warrant from the record is the often-repeated assertion (brief, p. 45) that the Government's torpedo embodies a principle of Davison's invention because the rate of feed is regulated in accordance with the pressure of the air to preserve the proportions of fuel, water, and air. As we show elsewhere (*infra*, p. 124) this may be true of the patented device, but no such regulation is present in the Government torpedo. Appellant's contention may not be advanced on this record. On the contrary, the question clearly has been decided and is concluded by the finding of fact that defendant does not infringe.

On page 7 it is said that the drawing of the device on which the contract is based is not referred to in the Findings of Fact. The first and last paragraphs of Finding XI, page 20, clearly identify Exhibit I, page 24, as a representation of the "device in question."

The statement on pages 77 and 7 that the defendant in the second trial in the Court below abandoned its contention that its torpedo operated in accordance with the Sodeau invention, expanded on page 93 to the still more extraordinary allegation that defendant abandoned the contention that its torpedo does not embody the "Davison invention," is not supported by the record and is not true. The second, third, and fourth of our present contentions as listed hereafter were those presented to the Court.

Indeed, the appellant throughout gives much greater attention to its own unsuccessful contentions in the Court below than it does to the record which that Court has certified on this appeal. Thus it prints as an appendix to its brief the former opinion of the Court of Claims which the Court in view of "additional evidence," causing amendment of the findings of fact "in important particulars," vacated and set aside and on page 6 of its brief praises the cogency of this opinion, concededly based on an incomplete presentation of the facts of the case.

As shown by the opinion of the Court on the defendant's motion for a new trial, reported in 55 C. Cls. 497, a new trial was granted under Section 175, Judicial Code, to prevent "fraud, wrong, or injustice" to the United States. Further evidence was taken and it seems that appellant is ill-advised to present to this Court the opinion of the Court below based on an incomplete record and repudiated by that Court

when, after consideration of the entire testimony, the Court reached a conclusion entirely different as to the achievements of the patentee in the art, the scope of the patent, the pertinency of the prior art, and the scope of the contract.

The absurd character of the plaintiff's claim when presented in the light of full evidence is strikingly accentuated by its curt dismissal on the second and full trial with *per curiam* opinion.

In conclusion we may point out the absurdity of appellant's extensive argument as to the disclosure of the patent, its minute analysis of the words of a claim in that patent, and its contention (p. 53) that defendant is estopped to question that analysis of the meaning of those words, when the brief admits (p. 65) that "the purpose of the license agreement was to secure to appellee the right to use the *steam generator devised by Davison regardless of any question either as to validity of patents he might obtain or as to the scope of their claims.*" (Italics ours.)

BRIEF OUTLINE OF CASE.

This is a suit on a contract in which the plaintiff seeks to collect from the United States a royalty payment with respect to automobile torpedoes such as are launched from submarines, torpedo boats, and aeroplanes by the United States Navy. If the contention of the plaintiff is sustained, the United States must pay the plaintiff the sum of eight hundred dollars (\$800) for each and every torpedo of

the present standard type used by it in the past, and the sum of eight hundred dollars (\$800) for each and every such torpedo which will be used by it for many years to come. It is a matter of common knowledge that the United States in the late war, relatively speaking, used few torpedoes, and yet the total amount involved as royalties up to the present time is measured in millions of dollars. The contract has many years to run. If the United States during those years should be engaged in warfare and should be called upon to use torpedoes as freely as our enemies or even our allies used them in the World War, the amount involved will be simply staggering. This is no reason why the Government should not be required to live up to the terms of the contract; but it is a sufficient reason why the Government should ask for a patient hearing on the merits and the law.

The contract (record, p. 19) recites that the petitioner is "the owner of the invention *known as Steam Generator for Automobile Torpedoes* covered by" certain applications for patent, and licenses the United States to use and have made for it the device then "known as Steam Generator for Automobile Torpedoes" on the payment of a specified royalty for each torpedo "equipped with the Steam Generator for Automobile Torpedoes." One of the patent applications referred to has since the date of contract matured as a patent and this patent will be referred to as the "patent in suit," although the

suit is not literally a suit on the patent. This patent was granted on an application of Gregory C. Davison, a former naval officer and the vice president of the plaintiff company, and bears the number 1,036,080. It is reproduced in the record, page 25.

The contract on its face thus refers by name to a certain device "known as Steam Generator for Automobile Torpedoes," said to embody various features of construction on which several patent applications then pending in the Patent Office were based. It was an invention in the sense of something which had been invented, a physical thing and, as will later be shown, was known to the parties at the time of the contract as a definite physical thing, represented only by a drawing or blue print.

The contract, as will be more fully shown in the course of this brief, was entered into at a time when the plaintiff undertook to install this particular physical thing, christened by the plaintiff a "Steam Generator for Automobile Torpedoes," the device of a drawing submitted by the plaintiff, in two old Whitehead torpedoes owned by the United States. It was anticipated that, if this installation or conversion of the old torpedoes was successful, a field of usefulness for the device would be opened up and other similar installations would be required. The license contract in suit was designed to empower the Government to complete these prospective additional installations. As a matter of fact, the United States has never made any further installations of the Davi-

son "Steam Generator for Automobile Torpedoes." The efforts of the plaintiff to improve the power plants of torpedoes were unsuccessful in the practical field and the present Government torpedo is the device which had, prior to the contract at bar, been placed in the hands of the defendant by plaintiff's commercial competitor, the E. W. Bliss Company. An attempt is now made to stretch the contract in suit to make it cover not the Davison "Steam Generator for Automobile Torpedoes" referred to therein by the name with which plaintiff had christened it, but anything alleged to be within the terms of the patent in suit, which at the time of the contract did not exist as such; and, not only that, but also, disregarding the relative position of the patent in suit in the art, to cover the said Bliss torpedo which had previously been made and tested. The very terms of the license contract, which name and define the physical thing which the parties had in mind and to which the scope of the contract was limited, are now urged in an attempt to extend the breadth thereof. An attempt is made to show the United States and the Navy Department in an inequitable position, as acquiring benefit from the plaintiff for which they seek to avoid making compensation, and thus to estop the defendant from showing the true position of its present torpedo and of plaintiff's improvements with respect to the general development of the torpedo art.

As a matter of fact, the Government has obtained nothing from the plaintiff or its assignor. Its present torpedo is an embodiment of the teachings of the prior art, admittedly existing before the invention of the Davison "Steam Generator" in question, and, in the form of a practical, complete torpedo actually running in the water more than twice as far as any previous torpedo, was in the hands of the Government not only before the contract in suit was executed, but before negotiations leading up to the contract were begun.

The case is an exact introversion of the Harvey Steel case which originated in the same court below and was affirmed by this court. (196 U. S. 310; 38 Court of Claims, 662; 39 Court of Claims, 297.) In the Harvey case the United States undertook to pay for the use of the "Harvey process," which in the contract was identified in part by reference to a patent and, having avowedly used this identical "Harvey process," undertook to escape its obligations by claiming that the patent was in fact invalid or not infringed. In the present case the United States undertook to pay for the Davison "Steam Generator" when used, that device being identified in part by reference to the patent application which finally resulted in the patent in suit. The defendant has not used the Davison "Steam Generator" at all; and it is the plaintiff who is here seeking an unfair advantage by attempting to recover, not for the use of the Davison "Steam Generator," which the Government

has never in fact used, but for something different which it alleges is within the terms of the subsequently granted patent; and although what the Government has used was something with the production of which the plaintiff had nothing to do, and which was known to the Government and had been successfully tested at the testing grounds under the Government's supervision before the defendant ever heard of the Davison "Steam Generator."

THE DEFENDANT'S CONTENTIONS.

The defendant's contentions will be briefly as follows:

1. Since the court below on the basis of all the evidence has found *as a fact* that the defendant has not used plaintiff's device or invention (Finding XV, Record, p. 23), its conclusion that the plaintiff cannot recover presents no question of law the determination of which can lead to reversal.

2. The contract was for a definite physical thing—the Davison "Steam Generator for Automobile Torpedoes"—identified by and known to the Government only through a drawing or blue print. This device the Government has not used, but instead it has used a device radically different in construction and operation, which device was made by the Bliss Company for the Government before the contract in question was made or was even suggested. (*Harvey Steel Co. v. United States*, 196 U. S. 310; 38 Court of Claims, 662; 39 Court of Claims, 297.) This contention is discussed particularly in the second section of the brief.

3. The contract, in referring to a device covered by a patent application then pending in the Patent Office and not fixed in the form of a patent, and more especially since the content and tenor of the application was not considered by the parties, can be held at the most only to relate to what the parties could reasonably have expected to be patented; that is, to the actual novelty in the disclosure of that patent application, irrespective of the form of the claims which the Patent Office subsequently permitted in the patent document. (*Eclipse Bicycle Co. v. Farrow*, 199 U. S. 581.) This is discussed particularly in the second section of the brief, pages 83-89. In the present instance the Government utilizes devices not novel with plaintiff's assignor, Davison, but actual embodiments of inventions of the prior art which existed not only in the form of printed publications before the date of his invention (see third section of the brief, pages 104-117), but which actually existed in the form of a completed torpedo built by the Bliss Company and successfully tested under Government supervision long before the contract was signed and even before negotiations leading to the contract were begun.

4. The patent in suit can not include and cover what was known to the public through a printed publication before the date of the patentee's invention and which the Government uses; and in fact it does not in its terms cover this. This is discussed in the third section of the brief.

FIRST SECTION OF THE BRIEF.

No arguable question of law can arise in view of the finding of fact that the defendant does not use.

1. There is no point of law in this case the determination of which could lead to the reversal of the judgment below.

The prayer of the petition (Trans. Rec. p. 4, bottom of page) is for judgment as royalty in accordance with an agreement designated a "Shop License" (appearing on pp. 5-7 of the record) and as compensation under the Act of Congress of June 25, 1910.¹ The prayer for relief under license is inconsistent with that for relief under the Act of 1910 referred to which provides for relief when the Government has used an invention "without license of the owner thereof or lawful right to use the same." The whole case, however, has been proceeded with as founded on contract, and it is this aspect of the case which will be first considered under this heading.

The court has found as a fact that—

It does not appear from the evidence that any of said devices or inventions have been manufactured or used by the United States. (Rec. near top of p. 23.)

The finding of law is (immediately below, on same page)—

that the plaintiff is not entitled to recover, and its petition is therefore dismissed.

¹ Act of June 25, 1910, c. 423; 36 Stat. 851; Comp. Stat. Sec. 9465.

The opinion (same page) concludes:

* * * the court is of the opinion that the shop license should not be so liberally construed as to prevent the Government showing the exact nature of the device it used and its difference from that covered by the plaintiff's claims.

Certainly there can be no fault found with this statement of the law. The shop license provided only for payment on torpedoes equipped with plaintiff's "Steam Generator for Automobile Torpedoes." Whether the license be liberally or otherwise construed, the defendant certainly does not have to pay for what it does not use under a contract which, leaving defendant the option whether to use the device or not, provides only for payment based on use. And the Court below has positively found as a fact that the defendant does not use.

This finding was made after consideration of all the evidence adduced in a lengthy trial. The petition was filed in 1914 and the record was not completed so that the case was ready for argument until 1918 and thereafter a new trial was granted and still further and important evidence taken (opinion of the court, Rec. p. 23). No less than six motions for amendment of the findings of fact were presented (Rec. pp. 7, 8 and 32), and four of these were granted, at least in part. The evidence related to highly technical subject matter involving the theory of operation of torpedo power plants and abstruse questions of physics and thermodynamics. As indicated in part

by some of the findings of fact, the Court among other things considered the history of torpedoes (Finding IV, p. 9), reports of technical investigations (Finding V, p. 10), and no fewer than fifteen prior patents and publications (Finding XIV, p. 23). None of the expert evidence explaining this subject matter is carried forward into the present record.

Appellant in its brief has apparently ignored the fact that this is a case at law. It proceeds as in an appeal in equity and its argument abounds in statements having no foundation in the record. Many of these relate to technical subject matter, such as should be explained by experts. There is extensive discussion of technicalities of torpedo construction, a lengthy exposition of the patented structure containing much theory not found in the patent itself and an argument concerning the prior art, all containing many statements the correctness of which we dispute. To meet this, we have necessarily embodied in the third section of our brief an explanation of the prior art, handicapped, however, by our unwillingness to go outside the record for its exposition. This condition clearly demonstrates that the question of infringement was one for determination by the Court below as a fact in the light of all the evidence.

Where, in the light of exhaustive evidence on subjects of this character, the Court has made a positive finding that defendant does not use plaintiff's device, it is difficult to see how its finding can be set aside. This Court could only reach its own inde-

pendent conclusion as to whether the finding was erroneous by going over the whole evidence which was before the Court below. Surely this Court will not on such a highly technical subject without the aid of the expert and other evidence which aided the lower Court, reverse that Court in its comparison and evaluation of the structures involved. (See *U. S. v. Société Anonyme*, 224 U. S. 309 at 322, referred to below.)

The Court will not reexamine the findings of fact made by the Court of Claims on evidence.

Keokuk & Hamilton Bridge Co. v. U. S., 260 U. S. 125.

Union Pacific Ry. Co. v. U. S., 116 U. S. 154, 157.

Talbert v. U. S., 155 U. S. 45.

In the *Union Pacific* case, this Court said (p. 158):

A conclusion could only be reached by considering all the testimony, weighing the facts, and weighing their comparative value as evidence. This presented in no just sense a question of law.

The finding made by the Court below is in a case of this nature a finding of fact not subject to review on the present appeal. Walker on Patents, fifth edition, says (Sec. 500, pp. 566 and 567):

Generally speaking, all questions of similarities or of differences between things, are questions for the jury in an action at law, and are therefore proper to be testified about by experts. Where a patent covers such of the things described, as perform a particular func-

tion, it is the business of the jury to decide, and therefore proper for an expert to testify, which those things are. And in general all issues of fact, including the issues of abandonment, invention, and infringement, are for the jury to decide, and their findings on these issues will not be disturbed unless against the weight of evidence.

An exception to this rule is where the defendants' device is made under a patent and the court is able from mere comparison to comprehend what are the inventions described in each patent involved in the action. In such case the question of infringement is solely one of law for the court to determine.

And, again, in considering trials of patent cases at law by a judge sitting without a jury, Walker states (Sec. 540, p. 598):

Where the judge finds as a fact that the patent is void for want of novelty, or that the defendant has not infringed it, and thereupon enters a judgment for the latter, it is undeniable that the fact so found is sufficient to support that judgment. In arriving at his opinion the judge may have misunderstood or misapplied the tests of novelty, or of infringement, but still his finding is conclusive; because on an appeal from a judgment at law the Circuit Court of Appeals is authorized to examine nothing but the sufficiency of the facts found.

In a case like the present where the structures to be compared differ widely and where a thorough understanding involves expert technical knowledge and a consideration of a voluminous prior art, the

question whether the defendant's device is equivalent to the plaintiff's device or within the terms of the patented claims is proper subject matter for determination as a question of fact by the jury or by the court acting as a jury. A recent and specific illustration is found in the case of *Trustees v. Fountain Corporation*, 218 Fed. 642, wherein the Circuit Court of Appeals for the Second Circuit (Lacombe, Coxe, and Rogers) affirmed and approved the holding of Judge Ray in the Court below, reported in 210 Fed. 169, who in denying a motion to set aside a verdict for the plaintiff stated (pp. 171-172):

Here the jury found that the one form of securing the sleeve to the box was the equivalent of the screw thread shown and an allowable equivalent in view of the prior art and the file wrapper and contents and the language of the claim, all of which was read and rehearsed to the jury. Can the court substitute its will and finding of fact for the finding of the jury, when that finding depends on the language and meaning and construction of a number of patents and the varying evidence of experts?

That this is the correct view of the situation is amply clear from the judgments of this Court in *St. Paul Plow Works v. Starling*, 140 U. S. 184; *Keyes v. Grant*, 118 U. S. 25.

In the former case this Court said at page 196:

We can not review the finding of the Circuit Court that none of the earlier patents put in evidence by the defendant antici-

pated the plaintiff's invention. Although the defendant excepted to this finding as a conclusion of law, yet it was really a conclusion of fact on the evidence which the Circuit Court had before it. Witnesses were summoned on both sides as to what the earlier patent showed; and we can not consider the evidence, as if this were a suit in equity.

The following is an abbreviation of the opinion in *Keyes v. Grant* cited:

The judgment entered on the verdict rendered in favor of defendants, in pursuance of the direction of the court, can be maintained only on the ground, either that the legal identity of the furnace described by Karsten with that covered by the plaintiff's patent was manifest as a matter of law, or that it was established as a matter of fact so conclusively by the the evidence that a verdict the other way could not be supported within the rule as stated in *Randall v. Baltimore & Ohio Railroad Co.*, 109 U. S. 476.

Clearly it was not a matter of law that the specification of the plaintiff's patent, and the publication of Karsten, taken in connection with the drawings intended in illustration, described the same thing. The differences were obvious. * * * So that it certainly was not a matter of mere judicial knowledge, that these differences were either not material in any degree to the result, or, if material at all, were only such as would not require the exercise of the faculty of invention, but would be suggested by the skill of an experienced

workman employed to produce the best result in the application of the well-known arrangements of the furnace. It was claimed, on behalf of the plaintiffs, that the furnace described in the patent and as used by them, embodied an idea not contained in or suggested by Karsten's publication. * * * It was insisted by the patentees that no such arrangement and combination were to be found in Karsten's publication or in the furnaces depicted in his figures, and that the improvement which they constituted was not the result of mere mechanical skill, but sprang from a genuine effort of invention. And this view was supported by the opinion of many experts skilled in the art.

In our opinion this was a question of fact properly to be left for determination to the jury, under suitable instructions from the court upon the rules of law, which should guide them to their verdict. And there was evidence upon both sides of the issue sufficient to require that it should be weighed and considered by the jury in the determination of the question and this implies that, if it had been submitted to the jury and the verdict had been for the plaintiffs, it would not have been the duty of the court to have it set aside as not supported by sufficient evidence. The court erred, we think, in withdrawing the case from the jury as it did by directing a verdict for the defendants.

In the case of *United States v. Société Anonyme Cail*, 224 U. S. 309, the findings of fact of the Court of Claims seem to have lacked the explicitness of the

finding of non-user in the case at bar, this court indeed (p. 311) complaining of the indefiniteness of the findings. This court stated (p. 322) that infringement was a question of fact, to aid in the solution of which expert evidence not found in the record before it was usually available, and expressed its doubt as to whether it should re-examine the question and consider the prior art and the scope of the patent without such aid.

In *Battin v. Taggart* (17 How. 74, at p. 84) this court said:

There are other questions of fact which come within the province of a jury; such as the identity of the machines used by the defendant with that of the plaintiffs, or whether they have been constructed and act on the same principle.

In the light of the citation of this decision by Mr. Justice Brown in his dissenting opinion in *Market Street Ry. Co. v. Rowley*, 155 U. S. 621, at page 630, the guarded language of the court in its prevailing opinion in that case, which is cited and followed in *Singer Co. v. Cramer*, 192 U. S. 265, 275, is significant. In the *Rowley* case the court took care to point out that:

No extrinsic evidence *was given or needed* to explain the terms of art or to apply the descriptions to the subject matter, so that the court was able, *from mere comparison*, to say what was the invention described in each, and to affirm from such mere comparison whether the inventions were or were not the same.

The question was, then, one of pure construction *and not of evidence*, and consequently was a matter of law for the court without any auxiliary fact to be passed upon by the jury. (Italics ours.)

This Court has in no case disapproved of the doctrine expressed in *Battin v. Taggert*, and it is evident that in *Singer Co. v. Cramer* above cited it intended to express merely an exception to the general rule when it said (see p. 275):

It is apparent from the face of the instrument that extrinsic evidence is *not needed* to explain terms of art therein, or to apply the description to the subject matter, and as we are able from mere comparison to comprehend what are the inventions described in each patent and from such comparison to determine whether or not the Diehl device is an infringement upon that of Cramer, the question of infringement or noninfringement is one of law and susceptible of determination on this writ of error. (Italics ours.)

It is submitted that it is clear from this language that it is only in cases wherein the question of infringement or noninfringement is so readily ascertainable from a mere inspection of the documents and the devices, and would not be aided by expert or other evidence, that it is error for the Court to refuse an instruction to find a verdict, and that infringement becomes a question of law, and it is further clear that this modification of the general rule does not warrant the Court in taking the case from the

jury where the differences between the two devices are substantial and not merely colorable. (See same case, p. 286.) This is a view taken by Walker in his work as already quoted and is supported by the decision of the Circuit Court of Appeals in the Second Circuit (Lacombe, Coxe, and Noyes) in *Heide v. Panoulis*, 188 Fed. 914, in an opinion discussing *Singer Co. v. Cramer* and other decisions of this Court, and concluding (p. 917):

In the case at bar there was conflicting testimony as to both invention and infringement. The experts disputed as to how prior patents worked and as to whether they were practical. * * * We are satisfied that under the authorities cited the trial judge would have committed error, had he decided these questions of validity and infringement, instead of sending them to the jury.

Where the finding of the jury or of the Court below has been made in view of evidence necessary to a proper interpretation of the structures and their modes of operation, which evidence is not before this Court, there is no basis for a review of the finding below.

If this be the rule as to a verdict found by an ordinary jury in those involved questions of fact present in patent cases, there is certainly no less reason for the rule supporting a positive finding of fact of noninfringement, as in the present case, by unanimous decision of the five learned judges of the Court of Claims, supported by a *per curiam* opinion.

It is conceivable that if it were apparent on the face of the papers and on an examination of the structures that no difference existed between the devices of plaintiff and defendant so that the error of the finding of the lower Court amounted to an error of law—so manifestly wrong that if the case had been tried by a jury it would have been error for the Court to have refused to charge the jury to find for the plaintiff—then this Court might, it is submitted, reverse the lower Court. But the differences between the two devices are manifest, numerous, and important; they spring to the eye from a mere examination of the plaintiff's and defendant's structures, as for instance in the contrast diagram facing page 150 below; they are so marked that the lower Court has found as a fact that the defendant has not used the plaintiff's device or invention; so important that plaintiff's device was a failure and defendant's a complete success. (Finding VIII, pp. 13, 14, and Finding XI, pp. 20, 21 Rec.) This finding founded upon, and the result of the weighing of, exhaustive evidence, including the evidence of those skilled in the art on both sides, this Court is asked to set aside, with only such information as is obtainable from its own unassisted comparison of the two devices.

If it be objected that this contention limits the right of appellant—it is sufficient answer that, as shown in *Union Pacific Ry. Co. v. U. S.*, 116 U. S. 154 at 157; *Tucker v. Spalding*, 13 Wall. 453 at 455, this limitation always exists in appeal or error in cases brought

at law, and the finding of fact is none the less binding on this Court, whose jurisdiction in such cases is limited to the review of points of law.

2. Still more clear is it that there is no error in law which could lead to reversal if the case be considered in the aspect of a prayer for relief under the Act of 1910, which is practically a trial of infringement.

The Act of 1910 puts all defenses in the hands of the Government and the burden of proving infringement is on the plaintiff. (*Agawam Co. v. Jordan*, 7 Wall. 583 at 609.)

From the discussion already given and the cases cited it is clear that in a case like the present, infringement is a question of fact. The rule is that if the differences between the patented device and the device complained of are obvious, it is not a matter of mere judicial knowledge to determine their materiality, especially where the differences are maintained by experts skilled in the art. Where there was evidence upon both sides of the issue sufficient to require that it should be weighed and considered by the jury, the jury's determination is final.

In the present case the lower Court has committed no error of law and has found nonuser or noninfringement, and the case presents no error open to revision by an appellate tribunal. The Court, finding the facts with the full force of a jury verdict, has, weighing the evidence, comparing the devices in the light of it, and not being led into any error by the wrongful admission of evidence or wrong charging or stating

of the law, is in position to render its finding with advantages that the appellate Court cannot possess.

On this point it is important to bear in mind that if the case be treated as one for infringement, the lower Court has pointed out the existence of devices in the prior art, experimented upon by the Government and others, and patented to Sodeau and others, which must be considered in interpreting the plaintiff's claims. In view of these the Court in its opinion said:

The question resolves itself into whether the Government used the plaintiff's device or something covered by one of the claims of its patents. We are of the opinion it did not.

It is obvious that this Court is in no position to question this finding without reviewing all the evidence upon which it is founded, which is not before this Court, and which this Court has repeatedly refused to have brought before it on writ of error or appeal in cases at law.

SECOND SECTION OF BRIEF.

The Events Leading to the Contract, the Form of the Contract, and Its Significance.

In considering the contract at bar we will in this section of the brief first explain the circumstances in which the parties found themselves at the time of the contract and the events which led up to that contract. The surrounding circumstances are not only admissible but necessary for a true understanding of what the bargain was.

Nash v. Towne, 5 Wall. 689, 699.

Burdell v. Denig, 92 U. S. 716 at 721.

Merriam v. U. S., 107 U. S. 437 at 441 and cases cited.

Chicago, etc., R. R. v. Denver, etc., R. R., 143 U. S. 596 at 609.

See also Williston on Contracts, Section 629.

In *Nash v. Towne*, cited, the Court said (*italics ours*):

Courts, in the construction of contracts, look to the language employed, the subject matter, and *the surrounding circumstances*. They are never shut out from the same light which the parties enjoyed when the contract was executed, and, in that view, they are entitled to place themselves in the same situation as the parties who made the contract, so as to view the circumstances as they viewed them and so to judge of the meaning of the words and of the correct application of the language to the things described.

The history of the adoption and use of water-cooled superheaters by the Government.

In 1907 Lieutenant Neves of the Brazilian Navy was at Fiume (at that time in Austro-Hungary) at the Whitehead Torpedo Works there. A novelty that came to his attention was a torpedo designed by Lieutenant Gesztesy of the Austrian Navy which was then being made ready for tests. He procured a description and illustration of this torpedo and sent it back to Brazil and in January, 1908 (Finding XIV, 14, p. 22), this was published in the *Revista Maritima Brasileira* (The *Brazilian Maritime Review*). This

article, which describes the torpedo later described in the British and French patents constituting Exhibits C 12 and C 13, respectively, is Exhibit C 14 reproduced in the Addition to Record, pages 63 and 35, and a diagram of the Gesztesy torpedo as described therein appears on page 103 following.

The Court below in its findings of fact (Finding V, paragraph 1, p. 10) characterizes the Gesztesy power plant as one providing "for the generation and use of steam in combination with compressed air and the gases of combustion for motive power" and this is effected by adding to an outside superheater a water tank with provision for admitting some of the compressed air to this water tank to displace the water and feed it to the combustion chamber.

This article in the Brazilian technical journal promptly came to the attention of officers in the Bureau of Ordnance. (Finding V, 1st paragraph, p. 10.) Recognizing it as an attempt to take practically a further step in the improvement of torpedo power plants, it was forwarded by the Bureau on March 26, 1908, to the E. W. Bliss Company, a commercial firm then, as now, manufacturing torpedoes for the Navy. On April 4, 1908, the Bliss Company returned the article with the statement (*italics ours*) that it had *for some time* had plans on the same general principle as that shown and that while they believed there were inherent difficulties against the successful operation of such a system, it intended at as early a date as possible to make certain tests of it. (Finding V, 2nd paragraph, p. 10.)

The Bureau of Ordnance urged the Bliss Company to continue its experiments on this line, to which the Bliss Company replied that at that time their testing facilities were fully engaged with current work. (Finding V, 3rd paragraph, p. 10.) At this time the final work in improving the outside superheater was under way, the Navy then being equipped with torpedoes of the inside superheater type, but by 1909 the outside superheater was perfected and in use by the Navy. (Finding IV, 2nd paragraph, p. 9.) By 1910 the Bureau of Ordnance received verbal information from the Bliss Company as to their experiments with water injection and the later action of that company as described herein clearly shows that they were fully abreast of the art and prepared with practical as well as theoretical knowledge of the subject.

Meanwhile, after the United States had in 1909 obtained outside superheater torpedoes, it did not neglect efforts toward still further improvement and undertook on its own account experiments relating to the injection of water. These experiments began in November, 1909, at the Naval Torpedo Station at Newport (Finding V, 4th paragraph, p. 10), and the clear understanding of the principles involved is shown by the official report covering these experiments made by the Ordnance engineer in charge in June, 1910, referred to and quoted in part in Finding V, p. 10. In that report the Ordnance engineer pointed out that in view of the limit of permissible heat on account of the melting or burning of material,

or the weakening of the structure of the mechanism, the only recourse for increasing the run of the torpedo (the air charge being fixed) was by adding to the volume of the air; that the problem therefore resolved itself "into that of injecting or otherwise introducing some liquid (water obviously being most suitable) into the heater space, the liquid by its evaporation absorbing the excessive heat and adding its own volume to the volume of the air," more fuel being burned "to give a higher temperature to evaporate more water to add more volume," and that the final limit to the possible gain in that direction was fixed by the amount of oxygen in the air flask charge which could be consumed in supporting combustion. In the letter transmitting the report the following statement was made (*italics ours*):

As will be seen from the description, the basic principle of the new design is the attempt to increase the range of the torpedo by the *introduction of some liquid, preferably water, into the superheater pot, the excess heat of the combustion of the alcohol or kerosene used as fuel being utilized to vaporize the liquid and increase the volume.* (Finding V, p. 11.)

At the time of this report the work on water injection was laid aside, not abandoned for failure as appellant contends, while those details were perfected "which have nothing to do with the heater" (Record, p. 11), and the record shows (p. 15) that the entire work was nearing completion when it was superseded by the successful development of the present Bliss torpedo.

The plaintiff company also had approached the problem through its employee Davison, formerly a naval officer in charge of torpedo development. Davison filed his application for the patent in suit on March 29, 1909 (Finding II, p. 8), although it did not issue until August 20, 1912, long after the events about to be discussed. The Government first learned of his work on July 26, 1910 when Commander Norton, the Bureau of Ordnance officer in charge of torpedo work, visited the plant of the plaintiff company for conferences on the subject of air compressors and gyroscopic control gear. At this time he learned something from Davison of his experimental work on the problem but was shown no component parts of the apparatus used. The work had evidently been abandoned, as Commander Norton requested Davison to *take up again* the development of his device. (Finding VI, p. 11.) It should be borne in mind that this visit of Commander Norton, when he first learned of any of Mr. Davison's work was subsequent to the Government's own work above referred to and after the official report to the Bureau of Ordnance based thereon made in June, 1910. (Finding V.) Thus Commander Norton and the Bureau of Ordnance were already familiar not only with the theory of the subject but with the practical problems involved.

The two needs of the Navy: First, to develop a long-range torpedo; afterwards, to modernize old torpedoes.

By 1910 the question of developing a long-range torpedo was an active one. It was generally understood by those familiar with the subject that such development would follow the lines of water injection. The E. W. Bliss Company, the plaintiff company, and the Navy on its own account all were canvassing the possibilities, and we may imagine that other navies were not idle. The situation was of vital interest to the United States. Our Navy could not be behindhand. The Gesztesy torpedo had already been tested at the Whitehead works at Fiume and naval officers of other countries, like Lieutenant Neves of the Brazilian navy, had seen it. Gesztesy's French and British patents had been published. The Sodeau British patent 6081 of 1907 of the British munition firm of Armstrong-Whitworth Company had been published. (Finding XIV, p. 22.) It was essential to the efficiency of our navy that the long-range torpedo should be completed in engineering design, should be reduced to practice as an actually existent thing in metal, a torpedo to run in the water, a weapon as efficient as any an enemy might have.

From this situation arose successively two demands of the United States Navy, and these led, respectively, to two entirely separate negotiations with the plaintiff company, from the second of which came the contract at bar.

The first need of the Navy was to develop a long-range torpedo, to demonstrate that it was a possible and practicable thing, to design a practicable power plant, to coordinate it with the other mechanisms of the torpedo, to build in fact a reliable functioning weapon. To meet this need it set to work, as we shall show, all available agencies and put in competition with its own engineers the E. W. Bliss Company and the plaintiff Company. In this competition the plaintiff Company failed completely. The Bliss Company built the Government's present torpedo and by September, 1911, it was running over 9,500 yards on the Government testing range.

The second need of the Navy arose only when the first had been satisfied, after the Bliss Company had demonstrated that the long-range torpedo was a possible and practicable thing. The plaintiff was still working on its own design of new torpedo and now raised an entirely new question. It stated that it had developed something new, a device which could be installed in old torpedoes and which would double their range. The Navy recognized the importance of such a device. It promised to meet the situation which had arisen from the success of the Bliss torpedo. At the end of September, 1911, the Navy had on hand a large number of Whitehead torpedoes of 4,000 yards range and under (Finding IX, top of p. 15), and it had the single new Bliss torpedo which had already run over 9,500 yards on the testing range, considerably more than twice the range of these old Whiteheads

(Finding IX, last par., p. 16) and which made them practically obsolete. It is a matter of common knowledge that at that time there was grave fear of war with Japan. If the Navy went out to fight, it would not be equipped with the best possible weapons, as it was impossible to construct overnight large numbers of the new torpedoes just perfected. The first problem, that of demonstration, had been solved; a second had arisen, one of equipment.

From the negotiations with respect to this new proposition of the plaintiff, characterized by the Bureau of Ordnance in one of its indorsements on the plaintiff's offer as "an entirely different proposition" from the first one relating to the development of a new torpedo (Finding IX, p. 16, top), under which the plaintiff was still working, arose the contract at bar. It concerned the second need of the Navy, which plaintiff proposed to meet, the need of rapid equipment.

The first problem: Plaintiff's unaccepted offer of August 8, 1910. Competitive work in developing long-range torpedo instituted.

After Commander Norton had learned on July 20, 1916, of Mr. Davison's interest in and experiments with torpedo power plants, the plaintiff's first dealings with the Government related to the first need of the Navy, the need for developing and demonstrating the long range torpedo.

Shortly after Commander Norton's visit to the plaintiff's plant, that company made a proposition to the Bureau of Ordnance which is embodied in

Finding VII on page 12 of the Record. This proposition is interesting chiefly for its audacity. This company, which did not get any torpedo into the water until more than two years later, wished to unload its untried devices on the Government, to do the manufacturing on a cost plus basis with the addition of exorbitant royalties, and also asked for a cash payment of \$100,000 down. This offer was never accepted or considered by the Government and its terms are of interest only in so far as they contrast with those of the contract at bar and demonstrate that the latter is a contract for a limited purpose only.

The proposition was absurd. The plaintiff had nothing to show. It did not even offer to show anything. "All plans and detailed information" were to be furnished only "when the license agreement goes into effect." (Record, p. 13, second paragraph.) The Government was offered a pig in a poke. It already had its own experiments well in hand; it had been receiving verbal reports as to the experiments of the E. W. Bliss Company. The proposition of this letter was never considered and it drops out of this case. Indeed, appellant nowhere refers to it in its brief, but it is mentioned here because it appears in the findings of fact.

Instead the Bureau of Ordnance proceeded with a plan for "determining the merits of the different motive power systems for increasing the range and speed of torpedoes" and on September 6, 1910, addressed both to the Electric Boat Company and to the Bliss Company substantially similar letters, proposing to each company that it undertake on an

experimental basis the production of two long-range torpedoes of different sizes, a certain performance to be the minimum and a bonus to be paid for a higher performance. In due course similar contracts were entered into with both companies, those with the plaintiff company being dated January 17 and 23, 1911, and those with the Bliss Company being dated February 16, 1911. (Finding VIII, first paragraph, p. 13.)

It is of interest to point out here that the plaintiff was fully aware of the conditions existing at the time and the presence of competitors in the field, as the Bureau informed each company that the torpedo constructed by it would be placed in competition with a torpedo to be submitted by another firm and with torpedoes being developed by the Bureau itself. (Finding VIII, first paragraph, p. 13.)

Unsuccessful work by plaintiff company in the competition.

The Electric Boat Company promptly undertook to build two experimental torpedoes. The history of its work on these torpedoes is simple. The proposition for its construction was broached in the fall of 1910. The formal contracts were signed on January 17 and 23, 1911. Not until October, 1912, did the Electric Boat Company complete one of the torpedoes. This torpedo did not develop the minimum range and speed required, although this minimum was only 4,000 yards, in itself no increase over what old torpedoes could do (Finding IV, second paragraph, p. 9), and the other experimental torpedo,

the 21-inch, was never completed. (Finding VIII, last paragraph, p. 14.) Since (as we shall show) the E. W. Bliss Company had in the meantime developed the present Government torpedo and it had been officially adopted and was being ordered in large numbers by the United States, the plaintiff company did not wish to spend any more of its time and effort on its unsuccessful work, and, at its own request, the contracts for experimental torpedoes were cancelled "without penalty" on June 16, 1914. (Finding VIII, last paragraph, p. 14.)

Prompt success of E. W. Bliss Company with defendant's present torpedo of Sodeau type.

The story of the development of the present Government torpedo with water-cooled superheater by the E. W. Bliss Company under the contracts of February 16, 1911, for building two experimental long-range torpedoes is much shorter in point of time but considerably more eventful in matter of results. We have already seen that the Bliss Company had, as early as April 4, 1908, told the Navy Department that it had "plans" which involved the use of water in torpedoes. (Finding V, 2nd paragraph, p. 10.) In response to the invitation of the Navy Department, on September 6, 1910, to undertake experimental torpedoes, the E. W. Bliss Company in the course of correspondence about a month later in its letter of October 14, 1910, made the following statement (Finding V, last two paragraphs, p. 11) (*italics ours*):

As the Bureau is probably aware, we have designed a new 21-inch torpedo on the general

lines of the Mark VI with a device added which enables us to *inject water into the superheater and materially increase the efficiency.*

While we have not yet carried our experiments in this direction to a finish, we have already obtained *twenty* million pounds of work out of the Mark III twenty-one inch flask full of air against *ten to eleven* million which we developed with the standard Mark III torpedo.

The E. W. Bliss Company worked first on the larger of the two experimental torpedoes—the 21-inch by 21-foot torpedo. It was completed in August, 1911. (Finding VIII, 2nd paragraph, p. 14.)

As early as September 24, 1911, the Government had this torpedo on the testing range at Sag Harbor and it had made a run of over 9,500 yards (Finding IX, last paragraph, p. 16), nearly five and a half miles.

We may be pardoned for digressing here to state that all this happened before the Department received plaintiff's letter of October 20, 1911, which contained its initial proposal leading up to the contract at bar.

The Bliss 21-inch torpedo was officially tested in the fall of 1911, accepted and paid for by the Government on the basis of having attained a range of 10,000 yards at a speed of 26 knots (Finding VIII, 2nd paragraph, p. 14), two and one-half times the range provided for by the contract (Finding VIII, 1st paragraph, p. 13) and two and one-half times the range of the outside superheater torpedoes which

the Navy had (Finding IV, 2nd paragraph, p. 9). The 18-inch torpedo was completed later, in May, 1912, and its performance in the test was far in excess of the minimum requirements of the contract and it was accepted and paid for. (Finding VIII, 2nd paragraph, p. 14.)

The success of the Bliss torpedo was immediate. The 21-inch torpedo, which had demonstrated its powers as early as September, was at once accepted. By January 18, 1912, the Bureau of Ordnance was preparing a contract with the Bliss Company for the manufacture of 50 torpedoes having similar power plants, and in the month of June, 1912, as appropriations became available, the Government let contracts to the Bliss Company for the manufacture of 290 torpedoes of this type. (Finding VIII, 3rd paragraph, p. 14.) From that time on the power plants of torpedoes used by the Navy and now complained of in this suit, except for slight improvements and modifications, have been "practical duplicates" of that of the Bliss Company torpedo which was tested and accepted by the Government in the fall of 1911 (Finding XIII, last paragraph, p. 22), and which as early as September, 1911, was running between nine and ten thousand yards in free route in the water on the Government's testing range. (Finding IX, last paragraph, p. 16.)

**THE OCCASION OF THE CONTRACT—PLAINTIFF
BROACHES THE SECOND PROBLEM, THE CONVERSION
OF OLD WHITEHEAD TORPEDOES.**

The first problem of the Navy, the production of a long-range torpedo had been solved by September 24, 1911. The plaintiff had as yet done nothing. It was not till a year later that it even completed a torpedo. (Finding VIII, last par. p. 14 and Finding XI, first par. p. 21.) But the Bliss torpedo was on the Government testing range at Sag Harbor and had run over 9,500 yards. (Finding IX, last par. p. 16.) Then arose the second problem, the problem of the old short-range torpedoes on hand which had suddenly become obsolete. Could these be expeditiously and cheaply brought up to date?

It was in connection with this second problem, arising only after the Bliss Company had solved the first, that the negotiations leading to the contract in suit began, negotiations entirely separate from and independent of any previous dealings with the Electric Boat Company. On October 20, 1911, came the new proposition. We quote the following paragraphs from plaintiff's letter of that date reproduced in Finding IX, page 14 (*italics ours*):

1. We beg to inform the bureau that we *have developed a device* which may be applied to *any automobile torpedo now in service*, and which will more than double the range of such torpedo.

2. We enclose herewith drawing No. C-10277 showing a general arrangement of this device applied to the Whitehead 5.2 m. x 45 cm. torpedo.

* * * * *

6. If the bureau desires us to fit one of its existing torpedoes with *this device*, we shall undertake to do so after arranging with the bureau for a *royalty to be paid on all torpedoes fitted with this device* in the future.

7. Our estimate of time required to *modify an existing torpedo* is five months, and cost fifteen hundred dollars (\$1,500).

8. We would ask one thousand dollars (\$1,000) royalty per torpedo for the first ten torpedoes, nine hundred dollars (\$900) per torpedo for the second ten, and eight hundred dollars (\$800) per torpedo for all torpedoes thereafter.

Accompanying this letter as the only explanation of "the device" referred to was a drawing or blueprint. The form and character of the said device are shown by the drawing and description constituting Exhibit 1 of the appendix to the findings of fact, the drawing facing page 24 of the Record. (Finding XI, first and last paragraphs, p. 20.)

The language of the letter wherein the plaintiff "informs the Bureau" that it has developed a new device for a specific purpose clearly shows that it relates to a new subject matter. There was no need of informing the Bureau that it had a design for a long-range power plant. The Bureau had heard of that more than a year before and the plaintiff was working on that device under a contract.

What were the parties now talking about? Evidently "*this device*" was the thing shown in the drawing, which was capable of being *applied to the Whitehead*

torpedo. The proposition was, as stated in paragraph 6 of the letter, for a royalty to be paid by the United States "on all torpedoes fitted with *this device* in the future," that is, with *this device*; the thing shown in the prints; the installation for the *conversion of Whitehead torpedoes*.

This letter was forwarded to the naval torpedo station for comment, and the following report was made by Commander Williams (Finding IX, p. 15):

1. The blue print forwarded herewith gives no information as to the methods by which the range of the torpedo is to be doubled beyond stating that the device is a steam generator. It is presumable that the device consists of a superheater into which is injected water. *The E. W. Bliss Company, proceeding along the same lines, have already a torpedo in the water which indicates the possibility of doubling the range of the torpedoes now in the service.* The torpedo station will in a very short time take up actual tank experiments with a new form of superheater which promises to double the range of the torpedo. The Schneider Company and the Whitehead Company are both experimenting with a superheater into which water is injected.

2. In view of the above it is not considered wise to enter into an agreement with the Electric Boat Company by which the bureau agrees to pay the Electric Boat Company a royalty for the use of a device in torpedoes presumably similar to devices made by other companies and to one which is in the course of development at the torpedo station, as by that

action the bureau would, in the opinion of the torpedo station, possibly involve itself in dispute if not in litigation with the other companies, and would be estopped from further development of its own superheater.

In other words, Commander Williams feared that the contract might cover the Bliss torpedo then in the Government's hands and the torpedoes with which the Government had been experimenting and torpedoes which foreign companies had developed—all along the lines of water-cooled superheaters. Commander Norton, at the Bureau of Ordnance, answered on November 2, 1911 (Finding IX, bottom of p. 15):

2. The proposition submitted by the Electric Boat Company in the attached letter as understood by the bureau is in effect as follows:

That they will take one of the present type of torpedoes, a Mark V Whitehead, or a Mark III, IV, or VI Bliss-Leavitt torpedo, and by the installation of the Davison steam generator and the removal of superheater, practically double the range of the torpedo, provided the torpedo will stand a lengthening of eight inches.

3. As the inspector of ordnance is no doubt aware, the bureau has contracts with the Electric Boat Company to furnish 2, 5.2 m. x 45 cm. and a 21' x 21" torpedo of the Davison type, which torpedoes will be run some time this fall or early next spring.

4. The attached correspondence is in reference to an *entirely different proposition* and yet connected with that proposition, inasmuch as

the steam generating device will be incorporated in the Davison torpedoes, and the bureau is given to understand that this generator is not in any sense a superheater, that it has been patented, and it is not to conflict with the present superheater rights.

5. Comment is desired on the advisability of loaning the Electric Boat Company a torpedo of the Mark IV or Mark VI types, in order that their device may be installed therein for test, since if it is possible to increase the range of the present four thousand yard torpedoes to eight thousand yards, a long-range torpedo could be obtained without much change in the installation for launching them overboard.

It is clear from the above what the Bureau of Ordnance understood the proposition to be. Certainly it had nothing to do with plaintiff's old letter of August 8, 1910, and appellant no longer contends that it had, not even mentioning that letter in its brief. That absurd proposition bore on the development as a new thing of a long-range torpedo. That was a dead issue. The success of the E. W. Bliss Company had killed it. This, as the Bureau of Ordnance said, was "an entirely different proposition." In a time of need the Electric Boat Company showed the Bureau of Ordnance a specific thing, a drawing of an installation with the proposition that the old Whitehead torpedoes could be changed over in five months and that the range could be doubled; that is, brought up from 4,000 to 8,000 yards. The proposition of a long-range torpedo was nothing novel. Commander Norton already

knew of the Bliss torpedo which was running 10,000 yards. That was a complete new torpedo and was not a device, such as the plaintiff now offered, which could be installed in old Whitehead torpedoes. If in a short time the Navy could bring its old torpedoes up to somewhat near this standard, it was a matter of decided interest, particularly in view of the political situation existing at that time.

On November 9, 1911, long after it was acquainted with the success of the Bliss torpedo, the Bureau replied to the letter of the Electric Boat Company. Its answer is reproduced in Finding X, p. 16. Paragraph 4 states that it is understood that the price of \$1,500 each paid for the conversion of the first two torpedoes which the Electric Boat Company was to undertake would cover the royalty payment. Paragraph 5 sets as a minimum standard a 50 per cent increase of range; that is, to 6,000 yards, although the Electric Boat Company expressed its confidence of doubling the range to 8,000 yards. Paragraph 6 (p. 17) is quoted herewith (*italics ours*):

If this arrangement be agreeable to the Electric Boat Company, please so inform the bureau in order that a requisition may be prepared for the converting of two 5.2 m. x 45 cm. Whitehead, Mark V, torpedoes at a total cost of three thousand dollars (\$3,000), and that an agreement may be drawn up for signature by the Navy Department and the Electric Boat Company in regard to *the royalty to be paid for any torpedoes that may be converted hereafter*, namely, at the rate of \$1,000 per torpedo for the first ten torpedoes

converted, \$900 per torpedo for the second ten torpedoes converted, and \$800 per torpedo for all torpedoes converted thereafter (Finding X, p. 17.)

We may be pardoned for digressing here to point out that all this correspondence, including the original offer of October 20, 1911, was subsequent to September 24, 1911, when the Government had on the testing range at Sag Harbor the Bliss torpedo which had already made a run of over 9,500 yards. (Finding IX, last paragraph, p. 16.)

On December 6, 1911 (Finding X, p. 18), the Electric Boat Company wrote (*italics ours*):

As regards paragraph 6 of the bureau's letter, it is our understanding that the royalty will apply not only to torpedoes which may hereafter be converted, but also to torpedoes which the Government may build at its own works, and *in which the device in question is to be used.*

On December 13, 1911, the bureau notified the company that it had made requisition for two Whitehead torpedoes and forwarded a blank shop license requesting the Electric Boat Company to fill in the proper blanks, the numbers of letters patent, and the like. (Finding X, p. 18.) The patent applications, including that on which the patent in suit was later granted, were never seen by the Bureau. (Finding X, last paragraph, p. 20.)

This blank shop license became the contract in suit which grew out of and was based on the offer of the plaintiff to increase the range of the old Whitehead torpedoes to 8,000 yards.

Tardy and unsuccessful result of the Whitehead undertaking.

The plaintiff company had contracted to take old Whitehead torpedoes and increase their range up to 6,000 yards by the addition of "the device in question." It had claimed that it could more than double the range, that is, increase the range to more than 8,000 yards, and had signified its ability to complete the work within five months. Requisition for these torpedoes was made in December, 1911. (Finding X, paragraph numbered 1, p. 18.) It was not until almost a year later, to wit, November, 1912, that these torpedoes were sent to the torpedo station at Newport for tests. (Finding XI.) After a long period of experiments at the torpedo station *one* of these torpedoes exceeded on *one* occasion the minimum run of 6,000 yards required for acceptance. On September 27, 1913, the naval torpedo board reported on these torpedoes as follows, Finding XI, p. 21 (*italics ours*):

In reference to paragraph 1 (f) of the precept. The board is of the opinion that—notwithstanding the fact that one Whitehead torpedo fitted with the steam generating device did, on one occasion, make a run of 6,000 yards at 27 knots—after a long period of experiments at the torpedo station, the *reliability of this form of steam generator has not been established*, and, due to the use of salt water, *there are grave doubts as to the practicability of this device*, as at present fitted, for service use.

It is recommended that no steps be taken toward the *conversion of service Whitehead torpedoes* into steam torpedoes of this modification until further investigation by the torpedo station has removed these doubts.

One Whitehead with the plaintiff's steam generating device, which it was hoped would give a range of 8,000 yards, on a single occasion nosed its way a few yards over the minimum of 6,000 yards specified in the contract. Here was a certain color of success. The Electric Boat Company had expended much money and effort on this work of such unsuccessful outcome. The money and effort had been spent in the best of faith and in an attempt to meet a real need of the Navy Department. The sum involved was small—\$3,000. Therefore, on October 6, 1913, the department passed on the plaintiff's bill and recommended that payment be made under the contract. (Finding XI, pp. 20, 21.) The Electric Boat Company has never made any other torpedoes for the Government and, in accordance with the recommendation of the board just quoted, the Davison "Steam Generator" has never been used in any of the Government's torpedoes except these two old Whiteheads in which the plaintiff installed it.

WHAT THE UNITED STATES CONTRACTED FOR.

The Contract for a Specific Device Not Now Used.

"The purpose of the license agreement was to secure to appellee the right to use the steam generator devised by Davison, regardless of any question either as to the validity

of patents he might obtain or as to the scope of their claims. Appellee was not concerned with any such matters, and that is why it did not think it necessary to examine the Davison application then pending in the Patent Office and in fact did not do so." Appellant's brief, p. 65.

This statement of appellant is what we have always contended. It sweeps away the labored arguments in appellant's brief as to the wording of the patent and the scope of its claims and leaves only the relatively easy question as to what the Davison "Steam Generator," so known to the parties at the time of the contract, was. An examination of the facts shows that it was the device of the drawing, the device to be used in converting old Whitehead torpedoes and nothing else.

What did the Electric Boat Company have to sell the United States and what could the United States have possibly wanted to buy from the Electric Boat Company except "the device in question," the device "known as Steam Generator for Automobile Torpedoes," the specific thing? A long-range torpedo, the Bliss torpedo, like those now complained of, was in the possession of the United States at the time. The Bureau of Ordnance knew all about its capabilities. The Electric Boat Company had never produced a torpedo.

The principle of water injection had been known to the Bureau at least as long before as the publication of the Gesztesy article in 1908, and had been made

the subject of experiments conducted by the Government itself at the torpedo station. By the plaintiff and by Mr. Davison the Bureau had been told of some past experiments which had had no practical fruition but had not even been shown any parts of the apparatus used. (Finding VI, p. 11.)

Although that was the situation, plaintiff's counsel now asks the court to believe that the officers of the Bureau of Ordnance assumed that Mr. Davison was a pioneer and inventor of the principles of water injection and that they negotiated on behalf of the United States a general patent license to cover and protect the United States with respect to the Bliss torpedoes which the Government already had in its hands. If the proposition were not so absurd, it would be insulting. We are asked to believe that intelligent men, Commander Norton and Admiral Twining, could, on no evidence at all, assume that an inventor who came to them with practically empty hands, who had never produced a torpedo, who had shown them nothing in metal, who brought them nothing but a half-comprehended sketch of an untried project, was a pioneer in an art with which they had long been familiar, and that he dominated and controlled a successful development originated and already carried to conclusion by another and competing company. This assumption would be based on the fact that they were told that the Electric Boat Company and Mr. Davison had what?—not patents, but patent applications with the contents of which they were unfamiliar and of which, when

they assented to the contract, they were not even informed as to the filing dates, and asked plaintiff to add them to the license. Plaintiff's reply spoke of them as "patents and applications whereby *this device* is protected." (Finding X, p. 18, and last paragraph, p. 20.) Had these officers had the slightest suspicion that they were entering into any agreement involving broadly the control of the water-cooled superheaters they would have insistently demanded a complete disclosure of the contents of the secret patent applications of the Electric Boat Company and sought technical advice. They did not do so because they were "given to understand" that they would not be embarrassed in any way as to the development of the Bliss type of water-cooled superheaters which they already had in their possession, and because they understood the contract to be for the use of a specific device devised by the Electric Boat Company for altering over old Whitehead torpedoes, and identified to the parties by a picture, a drawing, and not by the legal scope and disclosure of patents.

Remembering that the Government visualized "the device in question" from the drawing, could they conceive that the Bliss torpedo was any embodiment or colorable modification of that device? That torpedo (which the Government then had in the water and successfully tested), as hereinafter explained (*infra*, p. 112), takes the old outside superheater with a single liquid-containing tank (for fuel) and a single system of piping adapted to feed one liquid to the

combustion chamber by displacing or forcing it from the tank by a portion of the compressed air, and duplicates that chamber and system of piping so that two liquids (fuel and water) are fed instead of one, but in exactly the same way. What was "the device in question"? It is shown by the drawing forming part of Exhibit I and reproduced in the record facing page 24. (Finding XI, first and last paragraphs, p. 20.) There is no such duplication. Instead of a water tank there is provided a pump, marked "Fig. 5" in the drawing, with a sea intake not present in the Government's Bliss torpedo. There is a regulator chamber and overflow (fig. 6) connected to this pump. There is an equalizing valve which throttles down and controls the pump and an air connection thereto. Besides the main reducing valve there is an auxiliary reducing valve (fig. 2), not present in the Government's device, that works as a kind of relay. Instead of feeding the fuel directly by displacing it by air, a pipe is led to the fuel tank that pumps water into it and displaces the fuel by water forcing it into the combustion chamber. It has, or is claimed to have, all the devices of defendant's patent shown in the diagram on page 118 of this brief and a number of other devices, such as the auxiliary reducing valve. Apparent to any eye are fundamental ideas of design, the idea of not carrying water in the torpedo, as is done in the Government torpedo, but of pumping it in from the sea; the idea of feeding fuel, not by displacing it by air, as is done in the Government torpedo, but by displacing it by water mechanically pumped in; and

the idea of providing a mechanical regulator which will throttle down and actually check the supply of water delivered from the pump.

The officers of the Bureau of Ordnance could not have looked at this drawing and seen in it any resemblance to the Bliss torpedo which was running in the water. It is unnecessary to consider whether it is possible at the present time to build up a careful theory of equivalence based, not on "the device in question" or that "known as Steam Generator for Automobile Torpedoes," as shown in the drawing, but on the abstract, indefinite, and nebulous language of a patent claim which those officers never saw. The contract was not made on the basis of a desired equivalence of the language of a patent claim with the Bliss torpedo. It was made for "the device in question," as shown in the drawing, for the thing "known as Steam Generator for Automobile Torpedoes," without any reference to the claim of a patent which was not then in existence, and this drawing showed a device embodying radically different principles from the device then known to the Government and now utilized by it in the Bliss torpedo, a device which in its mechanical construction omitted the salient elements which in the Bliss torpedo had been added to the old Armstrong outside superheater to make a water-cooled superheater; that is, the separate water container and the duplicate system of piping, and which did embody a whole army of mechanical elements not utilized in that Bliss torpedo—a pump, a regulator throttling

the pump, an auxiliary reducing valve, and a piping system for displacing fuel with water. This was "the device in question," the device then "known as Steam Generator" to the parties, and it is not a device ever utilized by the Government except in the two converted Whitehead torpedoes in which it was installed by the plaintiff and for which the Government charitably paid.

It was represented to the court below that the Government entered into the contract at bar because the Electric Boat Company could offer it torpedoes having a much longer range than any torpedo the Government possessed or could procure. We have shown such were not the facts. We have shown (*supra*, p. 52) that at the time negotiations leading up to the contract were begun by the Electric Boat Company's letter of proposal, dated October 20, 1911, the Government had at the testing grounds the Bliss torpedo, a "practical duplicate" of the torpedoes now complained of (Finding XIII, last paragraph, p. 22), and this torpedo had already demonstrated its ability to run 10,000 yards. The Electric Boat Company's proposal related to torpedoes which were to run only 6,000 yards at a minimum and 8,000 yards at a maximum; and at that time the Electric Boat Company had never produced a torpedo. Plainly, the inducement which moved the Government to enter into this contract was not the expectation of obtaining torpedoes of increased or maximum range. Such torpedoes it already had. The inducement which moved the Government to enter into

this contract was, as we have shown (*supra*, p. 54), the expectation of being able by the addition of the specially designed "device in question" to bring the range of its old Whitehead torpedoes which were on hand up to something approaching the range of the new Bliss torpedo, which had made these old Whitehead torpedoes, having only a 4,000-yard range, obsolete weapons.

This is plain, not only from the surrounding circumstances, but it is made manifest by contemporaneous writings. Thus, in the first letter from the petitioner which initiated the negotiations which resulted in the contract at bar, the petitioner (Finding IX, p. 14), after saying that "we have developed A DEVICE which may be applied to *any automobile torpedo now in service*," offered to equip "one of the *existing torpedoes*," provided the parties could agree upon "a royalty to be paid on all torpedoes fitted with THIS DEVICE in the future." This offer was accompanied only by a blue print showing what "this device" was. The Bureau's reply (Finding X, p. 17) referred only to altering over existing torpedoes, and the petitioner in answering this letter, after saying that the terms mentioned were satisfactory, added that (Finding X, p. 17):

It is our understanding that the royalty will apply not only to torpedoes which may hereafter be *converted*, but also to torpedoes which the Government may build at its own works and in which THE DEVICE IN QUESTION is to be used.

The Government accepted this condition and the contract at bar was executed. It is clear, therefore, that at the time of the execution of the contract it was the understanding of both parties that the royalty was to apply only to torpedoes in which "*the device in question*," then known to the Government only by the blue print which the petitioner had placed in its hands, should be used.

It was contended before the Court below that the offer of October 20, 1911, was a renewal of the offer of August 8, 1910, with different terms. This is refuted by the terms of the offer itself, by the situation of the plaintiff at the time, and by the manner in which the Navy treated it. Indeed appellant has abandoned this contention and does not refer to the letter in its brief, but since the letter appears in the findings of fact we may consider the point briefly.

In the letter of August 8, 1910, the plaintiff had told the Bureau that it "had developed a device for increasing the range of automobile torpedoes." It had a contract relating to that device and was working under that contract. Now, more than a year later, there was no reason to write again about the old subject matter. But it brought up new subject matter of which the Bureau of Ordnance had never heard and wrote that it had "*developed a device which may be applied to any automobile torpedo now in service, which will more than double the range of such torpedo.*"

The old problem of the Navy, the problem of a long range torpedo, was in the past. But here was a new proposition, the proposition of converting the old Whiteheads by means of the specific device designed by the plaintiff. The Navy treated this as an entirely different proposition, as relating to a limited and transitory emergency. It did not organize a competition, as it had done when there was a question of developing a new torpedo. It dealt solely with the plaintiff for the particular thing the plaintiff offered. If it could use that specific thing which the plaintiff had, it would pay for it. If what the plaintiff had would satisfy its present need, it was not necessary to look further. But the contract contemplated solely that particular need and that specific device.

Not only does the correspondence between the parties before the contract at bar was executed definitely prove that the thing on which royalty was to be paid was "*the device in question*," something shown, and then shown only, in a blue print or drawing submitted by the petitioner; but contemporaneous writings definitely prove that it was the affirmative understanding, both of the Government and the petitioner, that the agreement did not cover either the Bliss torpedo which the Government had in its hands at the time, or the water-cooled superheaters which the Government's engineers had been experimenting with for some time (Finding V, p. 11), or any form of water-cooled superheaters other than "*the device in question*" which was shown in the blue print submitted by the petitioner. Thus, when

the proposition of the petitioner came to the attention of Commander Williams, he strongly recommended that it be not accepted, because (Finding IX, p. 15) he feared it might be construed to cover the said Bliss torpedo (which it must be remembered was a practical duplicate of the torpedoes now complained of) and the water-cooled superheaters which the Government's engineers had been experimenting with. The Bureau of Ordnance replied to Commander Williams's fears by stating (Finding IX, p. 16) that it had been "*given to understand*" that the contract would not "*conflict with the present superheater rights*" of the Government. So here we have a contemporaneous writing setting forth the understanding of the Government as to what the contract was to cover, which understanding was based on the representations of petitioner. This understanding, since it was not changed before the contract was signed, is binding on both parties.

Furthermore, the language of the written contract is entirely in harmony with, and, indeed, pointedly emphasizes the understanding of the parties, as indicated in the correspondence between them and the endorsements thereon, that royalty was to be paid only on "the device in question," and was not to be paid on such torpedoes as are now complained of, which are "practical duplicates of" the Bliss torpedo which was in the hands of the Government before the Electric Boat Company's proposal was submitted.

The ordinary form of license under patents is given in the Rules of Practice of the Patent Office at page 90. This ordinary form, after reciting the patents, licenses and empowers the licensee to manufacture and sell devices "containing the patented improvements," and provides for the payment of license fees on devices "containing the patented improvements." The contract at bar, on the contrary, does not empower the Government to manufacture, and does not provide for the payment of royalties on "the patented improvements," but it recites that the subject of the contract is "*the invention known as Steam Generator for Automobile Torpedoes,*" and it provides for the payment of royalties "for each of the first ten torpedoes equipped with *the Steam Generator for Automobile Torpedoes,*" etc. The words "known as Steam Generator for Automobile Torpedoes" definitely identify the particular device shown in the blue print submitted by the petitioner, an invention in its embodied physical form, because so far as appears from this record, and so far as we know, this is the only device which at that time was known as a "Steam Generator for Automobile Torpedoes." The specific device shown in said blue print, the thing he had invented, was christened by Davison a "Steam Generator" and is constantly referred to by this name in the correspondence. It is a sort of trade name for his particular device.

At that time no one dreamed of calling the Bliss torpedo and other torpedoes utilizing injected water by any such name. The Government torpedo sta-

tion (Finding V, paragraph 7, p. 11; Finding IX, p. 15), the Bliss Company (Finding V, last paragraph p. 11), the Bureau of Ordnance (Finding V, 3rd paragraph, p. 10), and Commander Williams, the officer in charge of the Government torpedo station (Finding IX, p. 15), all speak of "superheaters," describing them as superheaters into which water is injected. The name "Steam Generator" was devised and used by Davison to identify the particular device which he himself had gotten up and which was shown in the blue print, and, in a simplified form, in the drawings of the patent in suit. The bureau was "given to understand that the generator" (i. e. Davison's Steam Generator) "is not in any sense a superheater" and "is not to conflict with the present superheater rights." (Finding IX, 2d paragraph, p. 16.)

So we see that the written contract does not provide for the payment of royalties on the "patented improvements," as patent licenses usually do, does not provide for the payment of royalties on "water-cooled superheaters," as it would have done if it had intended to cover the Bliss torpedo then in the hands of the Government; but provides only for the payment of royalties in case the Government should use the specific thing then "known as Steam Generator for Automobile Torpedoes," which was the thing which the Government then knew, and knew only, by the medium of a blue print which it had received from the petitioner.

What was *the thing* concerning which the minds of the parties met in the agreement? Can anything be clearer than that the thing was the device shown in the drawing received from the plaintiff which is referred to in the correspondence as "the device in question" and which is referred to in the contract as the device "known as Steam Generator for Automobile Torpedoes"? The drawing was the only thing which was before them. The "device in question," the thing "known as Steam Generator," was specifically designed to be applied to the old Whitehead torpedoes for the purpose of making them over; but it might be used in other torpedoes. *It was not a new device to be constructed from the ground up, a new torpedo from warhead to propellers, as was the new and successful Bliss torpedo which the Government then had in its hands.*

This interpretation of the contract, as one for the use of a specific device, is amply sustained by the decision of this Court in *Burdell v. Denig*, 92 U. S. 716. This was a suit for infringement of the Wilson patent for a feeding device for a sewing machine. The defendants set up a license granted under an assignment by the plaintiff of a territorial interest to defendant's licensor. This assignment was of the right to use "Singer's patent sewing machine as mentioned in the patent granted to Isaac M. Singer, dated August 12, 1905." It was contended that the plaintiff never had any interest in the Singer patent and that the machine known as the Singer machine at the time the assignment was made embodied the

Wilson feeding device, and that as the plaintiff did own the patent for that device, the assignment was of the right to use the Singer machine with the Wilson device. This Court said:

It is certainly true that in construing a written instrument it is necessary and admissible to look to all the surrounding circumstances of the transaction which are necessary to discover its meaning. It may be admitted that if the facts above stated were conceded to be true it would follow that the reasonable construction of the contract would be such as the Court held it to be.

* * * * *

If the judge had said that if they (the jury) believed these facts to be established, then the license to Lowe authorized the use of the Wilson device in the Singer machine, we would affirm the judgment.

Comparing this with the case at bar we find in the latter that the contract is for the use of Davison's "Steam Generator for Automobile Torpedoes," just as in the case cited it was for the "Singer machine" as then known. The reference to patents, just as was the reference to the Singer patent in the case cited, is merely descriptive and not definitive. The reference to surrounding circumstances is equally necessary to determine the nature of the contract.

HARVEY STEEL CASE DISCUSSED.

The plaintiff has relied much upon the *Harvey Steel case* (38 Court of Claims, 662; 39 Court of Claims, 297; 196 U. S. 310). We agree with plaintiff's

counsel that the reasoning of the court in that case practically decides the issues in this case, but we say it decides them in favor of the Government and not in favor of the petitioner.

In the *Harvey Steel case* there was before the court a contract in which the Government agreed to pay a certain sum for the use of a specific thing, to wit, the "Harvey process," a description of which had been supplied to it. The Government had concededly and avowedly used that specific thing, but because the contract described the thing by reference to a patent, the Government contended that it should not pay the contract price because the patent was either invalid or was not infringed. In the instant case the Government has agreed to pay a certain sum for the use of a specific thing, to wit, the thing that was then "known as Steam Generator for Automobile Torpedoes," a drawing of which was supplied to it. The Government has never used that specific thing, but because the contract described that specific thing by reference to patent applications, which the Government never saw, the plaintiff here contends that the Government must pay the contract price if the nebulous terms of a claim in one of the patents referred to can be read upon what the Government has used, and is using, although that thing was not, at the time the contract was made, "known as Steam Generator for Automobile Torpedoes," but was always referred to as a superheater, and is, indeed, something which the Government had in

its hands and had obtained from a rival before negotiations leading up to the contract were begun.

The beginning, the middle, and the end of the decision of the Supreme Court in the *Harvey Steel case* is that when there is a contract to pay a royalty for the use of a specified thing, even when it is described in the contract by reference to a patent, the royalty must be paid if the specified thing is used, even if the claims of the patent do not cover it. There can be no doubt of what the doctrine of the case is, because in *U. S. v. Harvey Steel Co.*, 227 U. S. 165, this Court explained its decision in 196 U. S. and said that "The questions presented and decided were (a) whether under the contract of 1893 the United States could set up the invalidity of the patent as a defense, and (b) whether the United States ought to have been allowed to show that it had not used the patent, properly construed, although it had used 'the process communicated to it and known in common speech as the Harvey process' " (p. 168); and again, "This decision plainly refutes the contention now again urged that the Harvey process of the contract of 1893 is limited and strictly confined to the method of the patent, and it is here controlling. Furthermore, in no possible view do the findings in the present case present facts which even suggest the possibility of a different construction of the contract than that heretofore given," (p. 170.) The case has also been summed up by the Circuit Court of Appeals for the Second Circuit in *Pressed Steel Car Co. v. Union*

Pacific Ry. Co., 270 Fed 518 at 524, in the following language:

As to the *Harvey case*, what the court held in the first case was that the government's defense that it was not using the patented process was bad, even though it used a lower heat in making armor plate than the patent called for, because it was using the process known as the Harvey process, which was the actual process it had contracted for.

If then where the contract is to pay royalty for a specific thing the royalty must be paid when that specific thing is used, even if a patent referred to in the contract does not cover it; the converse of the proposition must be equally true. Therefore, when, as here, there is a contract to pay a royalty for the use of a specified thing, even when it is identified in the contract by reference to a patent, the royalty is not due if the specified thing is not used, even if the claims of the patent do cover it. In this case the specified thing on which it was agreed royalty should be paid was the device then "known as Steam Generator for Automobile Torpedoes," which device was shown in the blue print submitted by the petitioner, and nobody contends the Government has ever used that specific thing.

This case would be like the *Harvey Steel case* if the Government had used the device shown in the blue print submitted by the petitioner, and was here claiming immunity because the claims of the patents referred to in the contract did not cover it or are invalid. We do not deny that the claims of the

patent cover the thing shown in the blue print submitted by the plaintiff which, at the time the contract was signed, was "known as Steam Generator for Automobile Torpedoes," or that, so construed, the claims are valid. What we deny is that the Government has ever used the Davison device of the blue print which was then "known as Steam Generator for Automobile Torpedoes"; and nobody here contends that it has done so. The only device the Government has ever used is one which no one could then ever have identified by saying that it was "known as Steam Generator for Automobile Torpedoes," but is one which was always known as a water-cooled superheater, and one which the Government procured from the Bliss Company and had in its hands before negotiations which led up to the contract at bar were begun.

The *Harvey Steel case*, while thus representing in one sense the exact obverse of the present case, in another way differs entirely therefrom. There is no element of estoppel in the present case. In the *Harvey case* the process in question was revealed to the Government under the terms of the contract. So here the device of the plaintiff's steam generator, as shown in the drawing, was revealed to the Government. Here the resemblance ends. The Government ordered armor plates from other parties and specified that they should be treated by the "Harvey process," and informed the contractors that they should not pay royalties because the Government had a license. Here the Government has never

done anything with the information furnished them by the plaintiff after they gathered at a late date the further information that the plaintiff's device was impracticable. Instead, they went ahead ordering not the plaintiff's device but the Bliss device, which they had had before they received any information from the plaintiff.

In the *Harvey Steel case*, after ordering plates to be made by "the Harvey process," the Government attempted to deny that these plates made in accordance with the specifications of the Harvey process were within the terms of the contract, because it alleged that they were not within the terms of the patent referred to in the contract. This was a true estoppel *in pais*. The Court of Claims said in its opinion, 38 Court of Claims, 662 at 685, affirmed by this court, 196 U. S. 310:

A plainer case of estoppel never came before a court. The defendants first bound the claimant's hands by a contract which secured the right to themselves to use the invention and precluded the claimant from prosecuting the manufacturers as infringers. They next closed the claimant's eyes as against the manufacturers by advertising that the plates to be made were to be treated by the "Harvey process" and that "the prices must not include anything for royalties, as the department has acquired the right to use said process, and will indemnify the contractor against all claims therefor." They did not rescind the contract or give a notice which would have put the claimant on its guard, or enabled it to pro-

ceed against the manufacturers, but stood silent until the work was done and they had received the fruits of their agreement. Having received every possible benefit, they now seek to evade its obligations.

How different is this situation from the circumstances of the present case. Here the Government derived no knowledge as to the torpedo now complained of from the plaintiff. The prototype of the present torpedo was running 10,000 yards in the water before the Bureau of Ordnance ever saw the drawing which formed the basis of the contract. The United States has never held out that this torpedo, or those like it which have since been built, is the Davison invention or is "known as Steam Generator." It has put no impediments in the way of the plaintiff prosecuting any rights that it may believe it has against manufacturers of this torpedo. The United States has ordered duplicates of a torpedo which was known to it and was in its possession before the subject of the present contract was broached. Thereafter, in connection with an entirely distinct project—the conversion of Whitehead torpedoes—the United States entered into a contract with plaintiff. This contract was for the Davison "Steam Generator." The Government has never used the Davison "Steam Generator." In the *Harvey Steel* case it ordered plates as "Harvey plates" and then attempted to deny that they were "Harvey plates." In the present instance it has continued to make and have built Bliss water-cooled superheaters and it is no way estopped *in pais* to say that these super-

heaters are not Davison's "Steam Generators" but are embodiments of the prior art and not the invention of the plaintiff's assignor.

The patent claims never defined the scope of the contract.

It has been shown (*supra*, p. 62) that the device contracted for was a specific organization identified by a drawing and that the contract was not generally for any device within the scope of the claims of the patent which was to issue in the future. Apart from the positive proof afforded by the actions of the parties and their written statements in the correspondence which is in evidence and the language of the contract itself, it furthermore is clear, as a matter of general principle, that the terms of the claims as they now exist in the patent, granted months after the contract sued on, are not part of the contract and do not determine its scope or define the devices on which the Government is to pay royalty.

The contract, in so far as it refers to the patent in suit at all, differs radically from the ordinary patent license, because the patent was then a pending application, a secret record of the Patent Office, a mere claim of a right and no grant of a monopoly on behalf of the Government, and was still indefinite and unformulated. In the usual contract of license under a granted patent the licensee is bound by the terms of the patent claims and he is even held precluded from denying the validity of such claims. The reason is simple and clear. He contracts for rights under a patent, a definite and fixed document,

granting a limited monopoly, the metes and bounds of which are defined by the terms of the patent claims. Either he knows actually what bounds those claims place on the monopoly or he is charged with such knowledge, because the patent is a public record of of which all the world is charged with notice. With his eyes open he makes his bargain and is held to his bargain.

In the case of a patent application, however, no monopoly is granted and no metes and bounds are placed on that monopoly. The application leading to the patent is a secret record of the Patent Office controlled solely by the patentee and his privies. In the present case the defendant was not shown the patent applications of the Electric Boat Company (Finding X, last paragraph, p. 20), and the record will be searched in vain for any offer of the Electric Boat Company to apprise the Ordnance Bureau of the contents of those applications. The intention of the Navy Department is made clear by that action. They disregarded the patent applications because their contract was for a specific thing and not for general rights under patents.

If this were a contract for the use of an invention, even if we overlook the fact that by "invention" reference was made to the physical device shown by the drawing which the parties had under consideration, what did it cover? Did it cover anything within the terms of a patent claim subsequently granted irrespective of the actual validity of that claim? Obviously not. Suppose the plaintiff's patent had issued with a claim saying nothing more than the

words "An automobile torpedo." Could the plaintiff have come before this court and asked royalty for every automobile torpedo manufactured by the United States? If the United States had bound itself in advance to accept as the terms of its contract everything that the Patent Office might grant, it might be liable, subject only to relief in equity on the ground of undue hardship. But it did not do that. The most that can be said for the contract from the Electric Boat Company's point of view is that Mr. Davison had a novel invention and that the United States contracted for the use of the thing which was novel.

The claims allowed by the Patent Office are supposed as a matter of fact to define for those who read the patent what is in fact novel. They do not always do so with accuracy, and when the contract was entered into in the present instance the parties did not have this finding or adjudication of the Patent Office to serve as a basis for their agreement. Novelty could mean to them only what was, as a matter of fact, novel in the disclosure which Mr. Davison had made in his applications and not what the patent examiner believed was novel. If their contract is to be interpreted and the scope of that novelty determined, the scope must be determined by this court or some other court of competent jurisdiction and not by the examiners of the Patent Office acting *ex parte* and before whom the defendant had no representation. If the parties made a contract for something which was novel, your honors can not be ousted of

your jurisdiction by the fact that at a later time the examiner in the Patent Office made a statement that such and such was novel.

This obviously correct view of the matter is amply sustained by the decision of the Supreme Court in *Eclipse Bicycle Company v. Farrow* (199 U. S. 581). In that case, as in this, a license was granted under a pending patent application, although the licensee was in a much less favorable position than is the Government in the present instance, because it had undertaken to exploit and develop the invention. Nevertheless, the court held that it was not liable under the contract as to structures not embodying the actual invention of its assignor. The court said, (at page 588):

On the other hand, the contract was not made on the footing that no coaster or no combination of coaster and brake ever had been invented, and that the whole field belonged to Farrow. Both parties knew something of the state of the art. The very facts which show that they stood on an equal footing and that the company was not deceived by Farrow show that. The contract shows the same thing on its face. It recites that Farrow has invented, not a mechanism for coasting and braking, but an improvement pertaining to such mechanism. It was a contract having definite reference to the course of the Patent Office, and was for the contents of the application already filed. The application recognizes the existence of coasters. So that *the contract only embraces what the parties reasonably may be understood to have expected to be patented.*

On page 586:

The real questions in the case are whether the first mentioned Farrow device and the subsequent E 10 fall within the scope of the contract, and these questions depend more upon a careful construction of that instrument than upon nice discriminations between the patents that were or might have been issued. If either of the contrivances used embodies the invention described in Farrow's applications, then the defendant is bound to account for it by the express terms of its covenant, unless the contract is at an end.

And again, on page 591:

In this case, as in the former, a general indication of the nature of the device is sufficient on the question whether the latter embodies the former in the sense of the contract. This question is answered by the description which we have given. It is true that in both the sprocket wheel is arranged to engage or disengage with the main wheels of the machine, to allow coasting and to brake by a reverse action of the rider's feet. But the methods by which these results are accomplished are so different that it is only on the assumption that Farrow was in the broadest sense a pioneer, and had covered the whole ground, or at least that the contract put him in that position relatively to the defendant that the claim in respect of E 10 could be allowed. It is not pretended that Farrow occupied such a position as an inventor, and our construction of the contract does not give it the sup-

posed extent. The auditor found that there was a radical difference between the contrivances in construction and operation, and there has not been and could not be a finding to the contrary.

In the present instance it was well known to all parties that the principle of injecting water into the combustion chamber of the torpedo was not new. Davison recognized it when he stated in his patent specification that his invention which was to be patented was for an apparatus suitable for carrying out the principle. What could the parties reasonably have expected to be patented? The Government certainly could not have believed that Mr. Davison with his pump, his regulator chamber, his auxiliary reducing valve, and half a dozen other devices was displaying to them a novelty including the Bliss torpedo which they knew about before the Davison device was submitted to them. The invention, using that word in its sense as the intangible mental conception, was the actual novelty displayed by the disclosure of the pending application, in view of the existing state of the art as shown, in part, by the printed publications existing before Mr. Davison's conception. These printed publications included the patents to Sodeau and in particular the British patent 6081 of 1907.

As we show later (*infra*, p. 112), the present Government torpedo is in its principles and essentials the Armstrong-Whitworth superheater disclosed by these patents, invented by Sodeau, the assignor to

Armstrong, Whitworth & Company, built as Sodeau had designed it for use with two liquids, fuel and water. It is an embodiment of the prior art existing in printed publications before Mr. Davison's invention. It simply was not novel at the time Mr. Davison made his invention, at the time the patent application was made and at the time the contract was entered into, and it could not have been anticipated that any patent to be granted on Mr. Davison's patent application should include and cover the prior art as disclosed in the Sodeau publications, any more than it could have been anticipated that it would include every automobile torpedo.

When the parties contracted for rights under a pending patent application, the scope of the contract was not defined by the form which the Patent Office would later give to the patent when it was granted. The utmost they could have contracted for was the novel features embodied in the patent applications, the actual novelty. The device which the Government now makes is an embodiment of prior-art publications, not novel at the time Davison conceived of the device which he patented; and not within the terms of the contract.

THIRD SECTION OF THE BRIEF.

THE CONSTRUCTION OF TORPEDOES—THE INVENTIVE DEVELOPMENT THEREOF, THE PATENT IN SUIT AND ITS INTERPRETATION.

We have already indicated our view that a full understanding of the technical questions involved in the several structures can only be obtained by examination of the evidence which is not before this

court, and upon which the lower court reached its finding of fact that the defendant has not manufactured or used plaintiffs device. We shall in this section of the brief, however, endeavor to make the explanation as clear as possible from the papers forming part of the findings.

FIRST STEPS IN TORPEDO DEVELOPMENT.

The first steps in the development of the torpedo power plant may be very briefly reviewed. We should, however, recall that in the early history of the art the other features of torpedo construction were receiving development and attention, and only after such points as depth control and direction control had been mastered did the question of a large increase in the range become acute. It is useless to have a weapon which will shoot five miles unless it will go straight enough to hit the target.

The early torpedoes were operated with compressed air engines. Air was stored in the so-called air flask of the torpedo under a very high pressure for reasons of space economy, and released to the engine through a reducing valve which permitted the air to escape at a substantially constant reduced but still high pressure. This so-called "low pressure" air, being under a considerable pressure, could expand and perform useful work in the engine before it was exhausted therefrom.

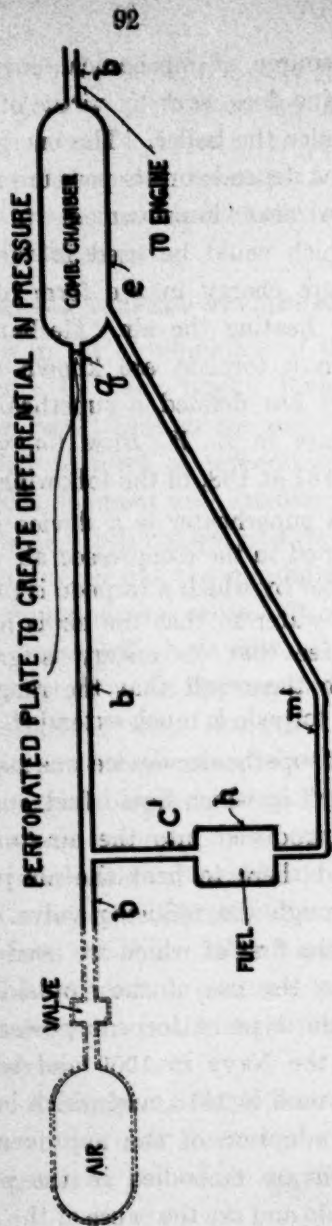
The amount of energy available from cold compressed air was limited and there were other disadvantages not necessary to dwell upon here. The

ordinary source of mechanical energy is heat. A steam engine does work by virtue of the coal that is burned under the boiler. The energy available in a body of gas depends on its pressure and its temperature. The next improvement to obtain greater energy which could be used in the engine was to supply more energy in the form of heat units by artificially heating the air. Mechanisms for effecting this in a torpedo are known as superheaters. This Court has defined a superheater through Mr. Justice Clark in *E. W. Bliss Co. v. United States*, 253 U. S. 187 at 188, in the following language:

A superheater is a device in which fuel is burned in the compressed air which drives the motor by which a torpedo is propelled through the water so that the air is heated to such a degree that its energy is greatly increased, with the result that the range of the use of the torpedo is much extended.

The first superheater device was a so-called "inside superheater" in which liquid fuel, such as alcohol or oil, was introduced into the air-storage tank itself and burned there to heat the air just prior to its release through the reducing valve. The following step, and the first of which we need to consider the details, was the use of the "outside superheater." This was the type of torpedo power plant first obtained by the Navy in 1909 and which was being practically used in 1910, and which immediately preceded the adoption of the improvements in power plant which are embodied in the present Government torpedo and are the cause of the present suit.

FIG. 2. U.S. PAT. TO SODEAU 835,262 OF 1906



There is reproduced herewith Fig. 2 of the drawing of the United States patent to Sodeau, 835262, of November 6, 1906 (Exhibit C-7, record, p. 22), which is reproduced in the addition to record following page 47. This represents diagrammatically the Armstrong outside superheater power plant as used by the Government in 1910 and which is described in Finding IV, p. 9. (Appellant's brief, p. 67.) In these torpedoes with outside superheater air stored under high pressure in a reservoir was released through a reducing valve, which provided throughout the run of the torpedo a supply of air at substantially constant pressure, which air was passed to the engine through a combustion chamber *e*. This combustion chamber *e*, exterior of the air flask, is a characteristic feature of the outside superheater, whether simple, as here shown, or water-cooled, as in the present types of torpedoes. In this chamber the air was heated before it passed to the engine by burning fuel therein. The fuel, contained in the tank *h*, was sprayed through pipe *m'* into the combustion chamber, being displaced from the tank by a portion of the low-pressure air admitted to the surface of the fuel through pipe *c'*. To permit the fuel to be displaced in this manner the pressure in the combustion chamber had to be less than the pressure on the top of the fuel in the tank *h*, and a lower pressure in the combustion chamber to provide for such differential in pressure was obtained by placing a perforated plate or restriction ring *q* in the main pipe leading to the

combustion chamber between that chamber and the branch *c'*. This caused a lower pressure to exist in the combustion chamber and the fuel was thus fed from the tank under the influence of the difference between the two pressures. As pointed out in the patent, the rate at which the fuel was supplied to the combustion chamber could be controlled by proper arrangement of the size of the openings through which it was discharged therein.

It is pointed out in the official report relating to the Government's experiments at the naval torpedo station at Newport, which report is partly quoted in Finding V, pages 10 and 11, that the amount of fuel which could be burned in a device of this character, and consequently the amount of heat units that could be utilized in the engine to turn out useful work, was limited practically by the high temperatures which would result and which, if too high, would destroy the metal parts of the apparatus. The present practice provides for a greater supply of energy—that is, a greater supply of heat units—with a reduction of the excessive temperatures through an injection of water into the combustion chamber, which cools down the products of combustion to a permissible temperature but makes available the surplus heat units through the vaporization of the water which passes to the engine in the form of steam. We thus have a water-cooled superheater. Useful work is obtained by burning a large amount of fuel to provide a large number of heat units, since heat is a form of energy, and a portion

of these heat units are made available through the medium of cooling water vaporized as steam. The idea, however, is not to make as much steam as possible, but to use all the heat units possible. For a given amount of fuel, the less water used and the higher the temperature obtained within permissible limits the greater the efficiency. In the present torpedoes of the defendant the motive fluid comprises the nitrogen of the air and also the products of combustion (in which products is included some or all of the oxygen of the air) and a certain amount of steam generated from the cooling water.

DISCLOSURE OF PRINCIPLES OF WATER INJECTION.

The principle of operating an engine with the gases produced by burning a large amount of fuel in air or oxygen with the addition of water was suggested at an early date. In fact, as we shall later point out, Davison in the specification of the patent in suit (record, p. 25) refers to it as a well-known thing, and states that his purpose is to provide a mechanism suitable for carrying out the principle and one safe to use in torpedoes.

In 1910 the mechanical constructors had pushed the outside superheater to its perfection, understood its limitations, and were ready to turn to and develop the water-cooled superheater and, as the story hereinbefore recited shows, not only the plaintiff company, but the E. W. Bliss Company, the United States Navy on its own account, and foreign powers had all commenced work on the next step of torpedo development—that is, the water-cooled superheater.

De Ferranti patent.

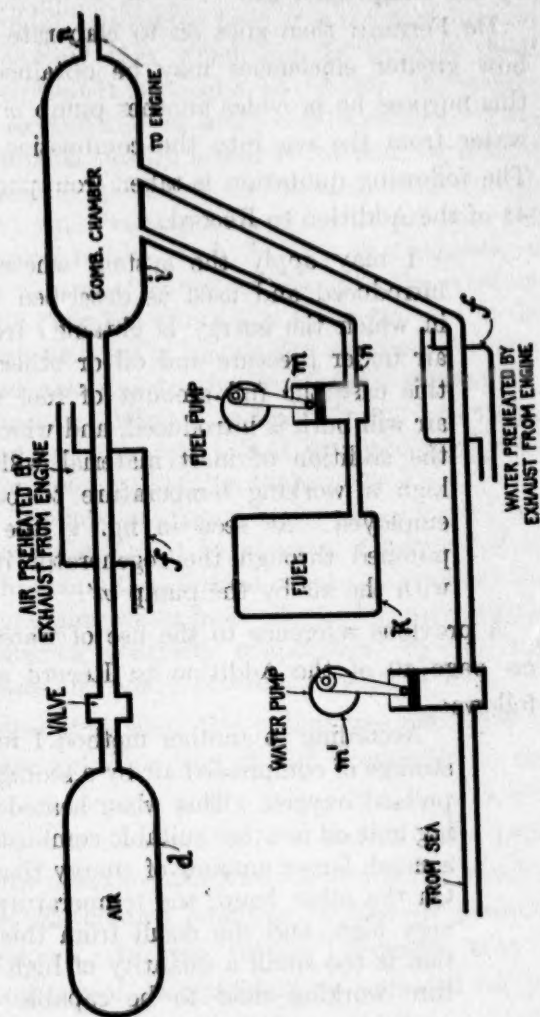
A complete exposition of the thermodynamic principles of a torpedo power plant and a full explanation of the efficiency which would be obtained by the use of water therein was given by the famous electrical engineer, De Ferranti, in his British patent No. 9946 of 1904, Exhibit C-5, which was issued as a printed publication on August 17, 1905. (Finding XIV, p. 22.) This patent is reproduced in the Addition to Record (p. 38). There is shown herewith a diagram of the De Ferranti torpedo in which the same reference numerals are employed as are used in the patent.

De Ferranti explains that his invention is especially suitable for the propulsion of automobile torpedoes, and shows the air chamber *d* and the reducing valve of usual type. He first describes a form of outside superheater. Thus, he states (Addition to Record, p. 39):

Instead of feeding these torpedoes with working fluid in the shape of cold air derived from the storage of compressed air, *d*, carried in the torpedo, I first lead the air * * * to the combustion chambers, *i*, in which the air is raised to a high temperature such as 1200° C. or thereabout by burning in it a small amount of oil or like fuel, for example, stored in a reservoir, *k*.

This fuel was to be pumped in by a pump *m* driven from the engine but De Ferranti also states, "As an alternative the pump *m* may be dispensed with and

DEFERRANTI BR. PATENT 9496 of 1904



the oil forced into the combustion chamber entirely by the compressed air."

De Ferranti then goes on to elaborate and show how greater efficiencies may be obtained and for this purpose he provides another pump m' to pump water from the sea into the combustion chamber. The following quotation is taken from pages 41 and 42 of the Addition to Record:

I may apply the system where water is introduced and used as described to motors in which the energy is obtained from stored air under pressure and oil or other fuel. In this case the full amount of fuel which the air will burn is introduced, and which without the addition of inert material will give too high a working temperature to be usefully employed. As seen in fig. 1, the water is pumped through the regenerator in parallel with the air by the pump m' .

A previous reference to the use of water appears on page 40 of the Addition to Record and is as follows:

According to another method I replace the storage of compressed air by a storage of compressed oxygen. This when heated by burning in it oil or other suitable combustible gives a much larger amount of energy than the air. On the other hand, the temperature given is very high, and the result from this combustion is too small a quantity of high temperature working fluid to be capable of useful application. It is therefore essential with this

method to introduce sufficient medium, which may be of an inert nature, to give the full amount of working fluid at a temperature not exceeding that which can be usefully dealt with that it is possible to get from the weight of oxygen and oil which can be carried. I accomplish this by means of introducing a fixed quantity of water, and mixing, evaporating, and superheating this so as to produce the desired result. * * * It is then discharged by means of spray nozzles into the combustion chamber where it is atomized, due to the high velocity of issuing through small orifices, and also due to the heat which it contains, which is sufficient to break it up into steam and so intimately mix it with the gases that complete evaporation takes place.

The heat contained in the water under pressure is sufficient to vaporize a portion of it. The steam thus formed internally atomizes the remaining water most effectually, thus greatly assisting complete evaporation by the hot gases and final mixture therewith.

It is clear that when this patent was published in 1905 every principle and theory applicable to the operation of torpedo power plants like those under discussion was disclosed to the public. The principle of the outside superheater in which fuel was fed either by mechanical pump or by the air pressure was disclosed. It was further disclosed that a greater output of energy could be provided for by

burning all the oxygen in the air with fuel and utilizing the energy thus created, while avoiding excessive temperatures by introducing water. Still further De Ferranti points to the possibilities of using compressed oxygen, which for a given volume would permit more fuel to be burned, describes the economy which might be obtained by utilizing the exhaust of the engine to preheat the air and water in the preheater *f* just as in the ordinary steam engine the feed water is heated by exhaust steam for economy in operation, and discusses many other possibilities.

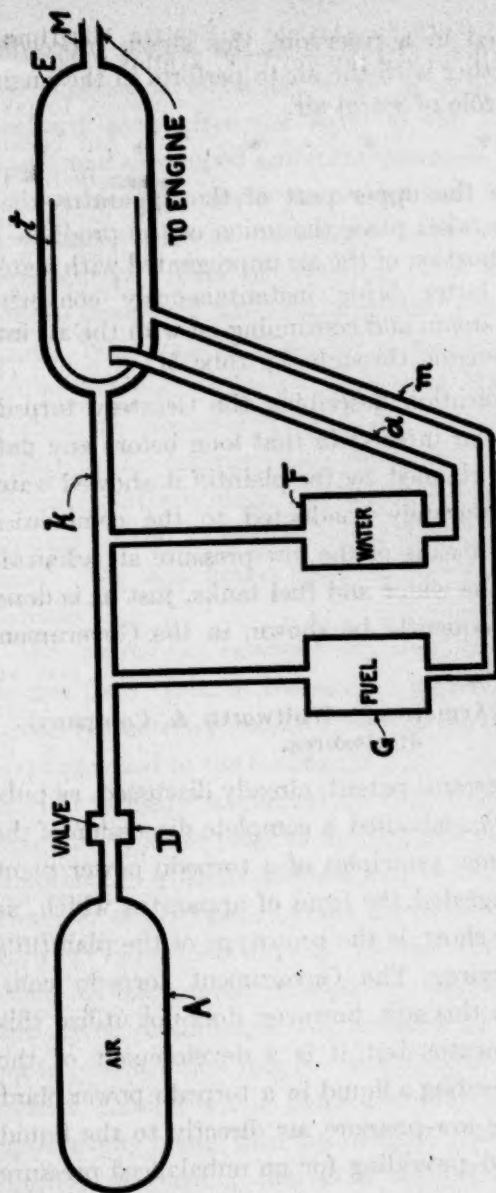
After this patent was published in 1905 there was no longer anything novel in the idea that torpedoes could be driven by a motive fluid produced by burning fuel with an oxygen carrier, and in particular the greatest possible amount of fuel for a given quantity of oxygen, and adding water for the double purpose of keeping down the temperature of the gases and providing another constituent for the motive fluid in the form of steam. This idea originated neither with the defendant nor with Davison, and Davison in his patent recognizes this fact and in the first part of that patent specification clearly states that the use of water would be desirable "provided an apparatus can be devised which is of the requisite simplicity in construction and regulation," and further states that "it is the object of the present invention to provide an apparatus suitable for the purpose."

As we will later show, the apparatus designed by Davison is a direct development of the particular apparatus disclosed by De Ferranti, whereas defendant's torpedo, while utilizing similar thermodynamic principles, utilizes an apparatus entirely different in form and character and developed along other lines.

**Gesztesy Torpedo—Article in Revista Maritima
Brazileira of January, 1908, Exhibit C-14.**

We will next refer briefly to the Gesztesy torpedo, not because it is next in point of time, but because the publication describing it was studied by the defendant's officers more than two years before anything was learned by them of the plaintiff's work (Findings V and VI), long before the contract in suit was proposed, and fully a year before Davison's patent application was filed in March, 1909. The article in the *Revista Maritima Brazileira* describing the Gesztesy torpedo is Exhibit C-14 and was published in January, 1908 (Finding XIV, p. 22), and came to the attention of the Bureau of Ordnance in March of that year. The article is reproduced in the Addition to Record (pp. 63 and 35), and in the annexed diagram the combustion chamber has been swung around to a horizontal instead of a vertical position to correspond with the other diagrams. The Gesztesy device, as characterized by the Court in its findings of fact (Finding V, p. 10), provides "for the generation and use of steam in combination with compressed air and the gases of combustion for motive power" and adds to the outside superheater torpedo with the fuel tank G and its system of piping a separate tank F for water. Air is admitted to the water tank and forces the water into the combustion chamber in the same way as the fuel is forced. The following quotations are made from the Revista article:

The purpose of the Gesztesy warmer is to quickly convert into steam the water con-



GESZTESY TORPEDO

REVISTA ARTICLE OF JANUARY 1908

tained in a reservoir, this steam proceeding together with the air to perform in the engine the rôle of warm air.

* * * * *

In the upper part of the apparatus there then takes place the union of the products of combustion of the air impregnated with water, the latter being instantaneously converted into steam and continuing on with the air into the engine through the tube M.

This publication describing the Gesztesy torpedo is of particular interest in that long before any date of invention claimed by the plaintiff it showed water and fuel separately conducted to the combustion chamber by means of the low-pressure air admitted directly to the water and fuel tanks, just as is done, as will subsequently be shown, in the Government torpedo.

Sodeau (Armstrong, Whitworth & Company)
disclosures.

The De Ferranti patent, already discussed, as published in 1905, embodied a complete discussion of the thermodynamic principles of a torpedo power plant and also suggested the form of apparatus which, as we will later show, is the prototype of the plaintiff's patented device. The Government torpedo complained of in this suit, however, does not utilize this type of apparatus but it is a development of the principle of feeding a liquid in a torpedo power plant by admitting low-pressure air directly to the liquid container and providing for an unbalanced pressure

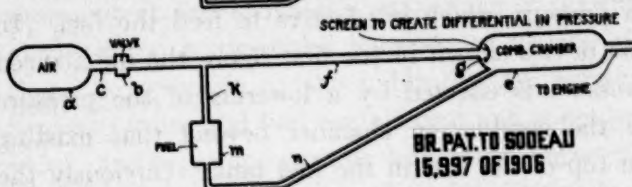
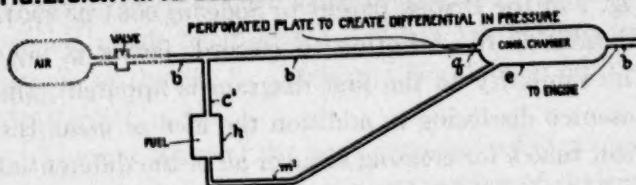
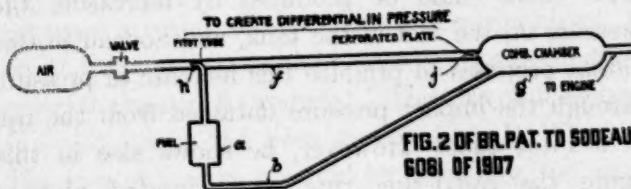
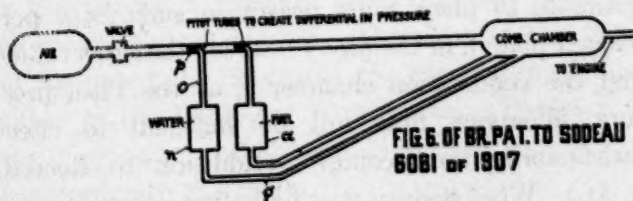
which will permit the air to displace the liquid into the combustion chamber, which principle was first disclosed soon after the issue of the De Ferranti patent and developed and made practical, first in the old outside superheater torpedoes and later in the defendant's present torpedoes with water-cooled superheaters. This development was due to one Sodeau connected with the munition works of Armstrong, Whitworth & Company of England. Certain British patents, which will here be referred to, were granted in accordance with the British practice jointly to this company and to the inventor, Sodeau, whereas corresponding United States patents were granted to the individual and assigned to the company. We will herein refer to these as "Sodeau patents."

We reproduce herewith in diagram form four figures from three of the several patents to Sodeau, which respectively constitute Exhibits C-7, C-8, and C-10 annexed to the findings of fact. The first figure is that already explained in connection with the diagram opposite page 93 and represents the outside superheater wherein fuel was fed to the combustion chamber of a torpedo by the action of the low-pressure air admitted directly to the fuel containing tank, an unbalanced pressure or differential in pressure being produced, in this instance by a perforated plate or restriction ring *q*. It will be noted that this patent, Exhibit C-7, is dated 1906, the United States application being filed on August 21, 1905. This method of feeding fuel in a torpedo power plant

by the direct action of the air under a differential in pressure, utilized by defendant in its present torpedo, thus came after the suggestions of the De Ferranti patent and disclosed to the public a principle, method, and apparatus whereby not only could fuel be fed, as disclosed in the Sodeau patent itself, but any number of liquids, for instance, both fuel and water, as suggested by De Ferranti and as later disclosed by Sodeau himself, as will presently appear.

In the first figure shown in the diagram the air flask and valve are drawn in in dotted lines, as they do not appear in the drawing of the patent itself (Addition to Record, following p. 47). The device, however, is described in the patent specification as "an apparatus suitable for torpedo propulsion," and the use of the usual air flask and valve would not only be understood by those skilled in torpedo construction, but was clearly disclosed by Sodeau himself in his British patent of 1906, shown in the second figure in the diagram. This second figure of the diagram is a simplification of the British patent 15997 of 1906 (Exhibit C-8, reproduced in the Addition to Record, p. 48) and is inserted here for the purpose of showing that the same patentee (Sodeau) clearly disclosed to the public how the combustion chamber and the differential pressure means, as shown in his United States patent and in his later British patent next to be referred to, were to be assembled with the well-known air flask and reducing valve. The feed of the fuel is effected in this patent in substantially the same way except that the un-

FIG. 2. U.S. PAT. TO SODEAU 835,262 OF 1906

BR. PAT. TO SODEAU
15,997 OF 1906FIG. 2 OF BR. PAT. TO SODEAU
6061 OF 1907FIG. 6 OF BR. PAT. TO SODEAU
6061 OF 1907

balanced pressure on the fuel is secured by different means, in part by the perforated screen *g* instead of the orifice plate or obstruction *q* of the earlier patent.

The third diagram represents a disclosure of Fig. 2 of the British patent to Sodeau, 6081 of 1907. (Exhibit C-10, Addition to Record, facing p. 50.) The similarity to the first diagram is apparent, the patentee disclosing in addition the idea of using the Pitot tube *h* for creating some or all of the differential in pressure which is effective to feed the fuel. In the device shown in the first figure the unbalanced pressure is effected by a lowering of the pressure in the combustion chamber beyond that existing on top of the fuel in the fuel tank. Obviously the same effect could be produced by increasing the pressure on the fuel in the tank, and Sodeau in this patent proposes to produce this increase in pressure through the impact pressure obtained from the use of a Pitot tube. However, he shows also in this figure the restricting ring or perforated plate *j* and states that "in many cases it may be found desirable to place some resistance, such as a perforated plate *j*, in the pipe *f* between the Pitot tube *h* and the combustion chamber *g*, as the Pitot pressure difference may not be sufficient to effect satisfactorily the feeding." (Addition to Record, p. 51.) What Sodeau was patenting—that is, what he was claiming as his invention as distinguished from what he was disclosing to the public—was the idea of utilizing the phenomenon known as Pitot effect either to feed or to aid in feeding liquids in a

torpedo power plant whether fuel as in the outside superheater of his United States patent shown in the first figure of the diagram or, as will presently appear, both fuel and water as in the defendant's present water-cooled superheater. In the words of his claim he disclosed "means for feeding fuel, water, or the like." (Claims of the patent, Addition to Record, p. 53.)

The last figure of the page reproduces Fig. 6 of the same patent and shows the application of Sodeau's ideas to the water-cooled superheater already disclosed in principle to the public by De Ferranti. Separate water and fuel containers *a* and *n* are provided, and separate conduits lead air to these containers to displace water and fuel individually as separate streams to the combustion chamber. To effect this feeding, an unbalanced pressure or differential in pressure is produced. The idea of using both fuel and water had been disclosed by De Ferranti. The idea of feeding a liquid by admitting the air to a liquid-containing tank to displace the liquid under a differential in pressure had previously been disclosed by Sodeau himself. Therefore, in this figure of his patent, he illustrated the adaptation of Pitot tubes to the feeding of both liquids. However, in the description (Addition to Record, p. 52), he says in referring to this figure:

The feeding of water or the like may, of course, be aided by means of a resistance in the path of the main air stream as in the case of feeding the fuel.

The latest of the Sodeau patents just referred to, British patent 6081 of 1907, was published as a printed publication on April 23, 1908. (Finding XIV, p. 22.) This is months before any date of invention claimed by Davison who did not file his patent application until March, 1909. Long before Mr. Davison had conceived of the ideas embodied in his patent and years before he and the plaintiff company ever produced anything which might charitably be called a torpedo, Sodeau had disclosed to the public through printed publications the entire principles of an apparatus which as a matter of fact corresponds in all respects to defendant's present torpedo now complained of.

What the public learned from Sodeau is represented by the second diagram herewith reproduced facing page 114 in contrast with a diagram of defendant's torpedo. Here is a torpedo power plant with an air chamber and reducing valve which admits the air to the main conduit leading to the combustion chamber. Separate fuel and water containers *a* and *n* are provided and separate conduits lead air to these containers to displace the water and fuel individually as separate streams to the combustion chamber. This feeding, in accordance with Sodeau's invention embodied first in the Armstrong outside superheater, is effected by creating a differential or unbalanced pressure on the liquids in the tanks. Obviously those skilled in the art might select such means of producing

such a differential as they might choose or believe would be efficient. A Pitot effect could be utilized, as shown in Fig. 6 of the patent. If this were not sufficient, as the patentee himself points out, it could be aided by a perforated plate or restriction ring in the main air conduit. Both these devices could be used in combination just as they were shown in Fig. 2 of patent 6081 of 1907, the third figure of the preceding diagram, and as there described in connection with Fig. 6, the fourth figure of the diagram. In the contrast diagram herewith which shows also the Government torpedo both means are shown in accordance with the printed description in the patent of how the structure of Fig. 6 could be modified. To control the rate at which the liquids are fed, Sodeau described in his United States patent a proper proportioning of the openings through which they are discharged to the combustion chamber. Given a differential in pressure sufficient to overcome the resistance in these openings, and the small difference in effective level between the position of these openings and the surface of liquid in the tanks (and it will be recalled that a pound of pressure will sustain a 2-foot column of water), it is a mere engineering problem in designing the exit openings to discharge into the combustion chamber a given amount of fuel and water.

The De Ferranti patent, published several years earlier, had described using the greatest amount of fuel which the air would burn and injecting water to bring the products of combustion to a permissible

temperature. The apparatus disclosed by Sodeau was obviously adaptable to carry out this principle by a proper mechanical design to control the amount of fluid fed, and as a matter of fact the defendant's present torpedo complained of in this suit is an exact embodiment of the Sodeau inventions.

DEFENDANT'S TORPEDO DESCRIBED—AN EMBODIMENT OF THE SODEAU INVENTIONS.

It is found by the Court that the defendant's torpedoes which are now complained of are "practical duplicates" (Finding XIII, last paragraph, p. 22) of the experimental 21-foot by 21-inch torpedo originally built by the E. W. Bliss Company, which as early as September 24, 1911, before the contract at bar was proposed, the Government had on the testing range at Sag Harbor and which had made a run of over 9,500 yards. (Finding IX, last paragraph, p. 16.) The power plant of the Bliss torpedo shown in Exhibit III facing page 30 of the record is the apparatus of the Sodeau patent 6081 of 1907, published in April, 1908, long before Davison conceived of the device of his patent in suit. This structure of the prior art cannot be a part of any invention of Davison's and cannot be within the scope of his patent.

As your honors are aware from your consideration of the case of *E. W. Bliss Co. v. United States*, 253 U. S. 187, the E. W. Bliss Company had a working arrangement with Armstrong, Whitworth Company of England, the joint patentee of the Sodeau British patents and the assignee of the United States patents.

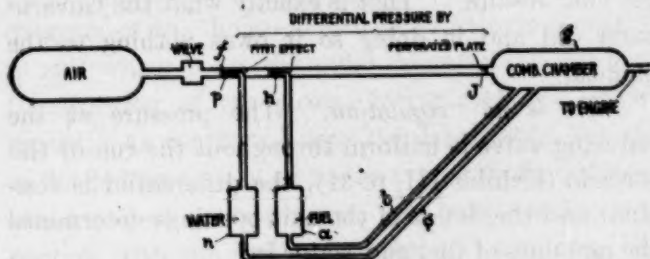
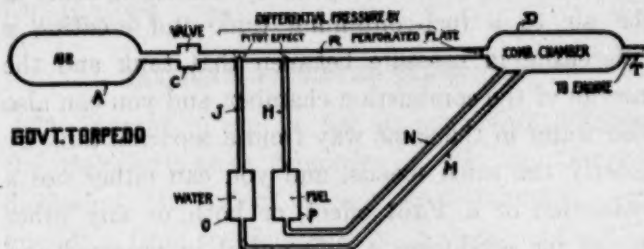
The contrast diagram will show the identity between the Sodeau disclosure and the Bliss or Government torpedo. The letters attached to the diagram of the Government torpedo are the same as those in the drawing forming a portion of Exhibit III but we have shown the two pipes H and J as if they were separate pipes throughout all their length whereas in the actual construction for convenience they are merged into a single pipe G in the portion nearest the reducing valve C. It is clear, however, that functionally there are two separate conduits, one leading to the water tank *P* and the other to the fuel tank *O* just as the Mt. Pleasant and Georgetown street car lines in Washington are separate lines and reach different destinations although they run over the same tracks as far as Dupont Circle.

In both the Sodeau disclosure and the Government torpedoes water and fuel are individually placed in separate compartments and these are provided with systems of piping whereby air is led from the low pressure side of the reducing valve separately to each one of these compartments and the discharge of liquids displaced by the air to the combustion chamber through separate pipes is provided for. To permit this displacement there is provided in each torpedo means for producing a differential in pressure so that water and fuel are fed into the combustion chamber. The Navy utilizes a perforated plate or restriction ring (Exhibit III, p. 32, Exhibits B-2, letter J, B-3

and B-4, Addition to Record), and also a Pitot effect.¹ (Exhibit III, p. 32.)

Sodeau likewise provides for utilizing a Pitot effect and for reinforcing this Pitot effect by means of a perforated plate *j*. While the essential fact is simply that a differential in pressure is established and any known means could be utilized for effecting such change of pressure, as a matter of fact the Government utilizes what is described by Sodeau, the joint use of the Pitot phenomenon and the perforated plate or restriction ring. In the old outside superheater of the Sodeau United States patent, the idea was disclosed of feeding fuel by actually displacing the fuel from its containing vessel by some of the low-pressure air under a differential in pressure and in the Government torpedo now complained of an additional water tank is added from which water is fed in the same way as the fuel is fed. The Sodeau United States patent 835262 of 1906 (Exhibit C-7) showed fuel displaced by air under a differential in pressure produced by a restriction ring or perforated plate. Fig. 3 of the British patent 6081 of 1907 (Exhibit C-10) showed fuel fed under a differential produced by a Pitot tube, Fig. 2 showed fuel fed by the combined effect of a Pitot tube and a perforated plate and in Fig. 6 the patentee illustrated the feed

¹ The diagram gives merely a graphical indication that a Pitot effect exists and does not purport to represent pictorially the actual physical structure utilized. The Court below has found the existence of this Pitot effect in defendant's torpedo (Finding XIII, p. 21 and Exhibit III, p. 31) and the subject can be sufficiently understood by reference to the actual valve casting of the defendant's torpedo which is in evidence (Exhibit B-4). The valve in the casting is somewhat raised and it will be seen that the stream of air coming from beneath it is directed toward and into the opening where the branch pipe leads to the water and fuel tanks and that the column of air will rush into this pipe, creating a pressure due to its velocity.



SODEAU TORPEDO
 FIG. 5 OF DR. PAT. 6001 OF 1907
 WITH PERFORATED PLATE OR
 RESTRICTION RING AS IN FIG. 2 AND
 AIR FLASK DRAWN IN.

of water in conjunction with fuel in exactly the same way as in Fig. 3 by the use of a Pitot tube and described the conjoint use therewith of a restriction ring or perforated plate as illustrated in Fig. 2. The Sodeau disclosures state to those skilled in the art in substance, "You can feed fuel to the combustion chamber of a torpedo by admitting some of the air to a fuel-containing tank and creating a differential in pressure between that tank and the interior of the combustion chamber, and you can also feed water in the same way from a separate tank by exactly the same means, and you can either use a restriction or a Pitot effect, or both, or any other means for producing a differential in pressure and get your results." That is exactly what the Government did and in doing so it owes nothing to the plaintiff.

There is no "regulation." The pressure at the reducing valve is uniform throughout the run of the torpedo (Exhibit III, p. 31), the differential is constant and the design of the exit openings determines the amounts of fuel and water fed.

It is clear that the Sodeau disclosure as embodied by the Bliss Company in the Government's torpedo promptly took its place in the practical art. The time lag usually intervening between conception and practical application was even shorter than in the case of previous torpedo improvements. The outside superheater was described in Sodeau's patent No. 835262, filed in 1905, and came into use in 1909. (Finding IV, p. 9.) The Sodeau British patent

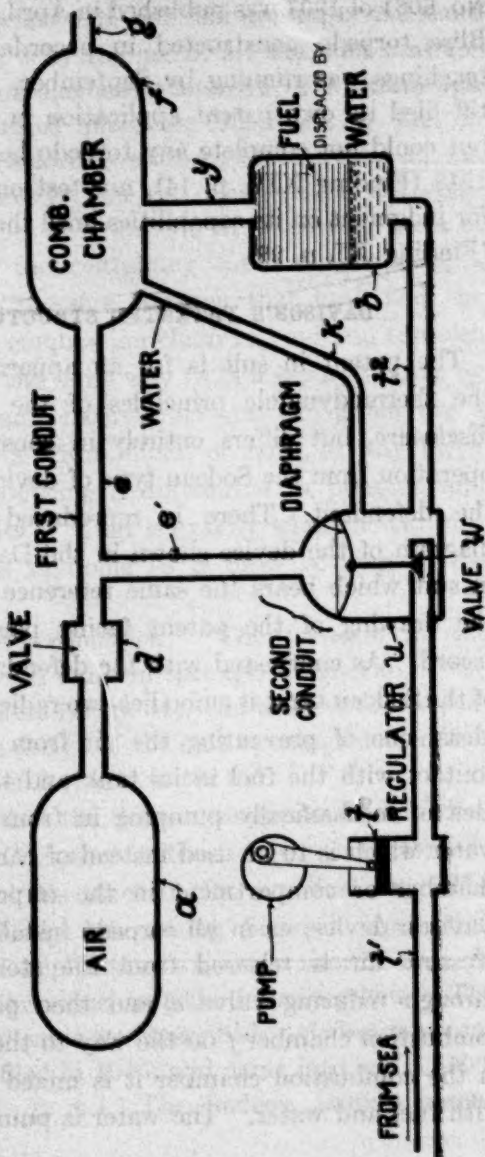
No. 6081 of 1907 was published in April, 1908, and the Bliss torpedo constructed in accordance with its teachings was running by September, 1911. Plaintiff filed its own patent application in March, 1909, but could not complete any torpedo before October, 1912 (Finding XIV, p. 14), nor test one sufficiently for judgment on its capabilities until the end of 1913 (Finding XI, p. 22).

DAVISON'S PATENTED STRUCTURE.

The patent in suit is for an apparatus utilizing the thermodynamic principles of the De Ferranti disclosure, but differs entirely in construction and operation from the Sodeau type of device utilized by the defendant. There is reproduced herewith a diagram of the device shown in the Davison patent in suit which bears the same reference numerals as the drawing of the patent facing page 25 of the record. As contrasted with the defendant's torpedo of the Sodeau type, it embodies two radically different ideas, one of preventing the air from coming into contact with the fuel in its tank and the other the idea of mechanically pumping in from the sea the water which is to be used instead of carrying it in a chamber or compartment in the torpedo. In the Davison device, as in all torpedo installations, high pressure air is released from the storage tank *a* through reducing valve *d* and then passes to the combustion chamber *f* on the way to the engine and in the combustion chamber it is mixed and burned with fuel and water. The water is pumped in from

PATENT IN SUIT

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the sea by a pump *t* into the chamber of a regulating device *u* having a diaphragm subjected to the pressure of the low pressure air, which diaphragm controls a valve *w* leading from the pump. As contrasted with the Sodeau type of power plant the air never comes into contact either with the water or the fuel and does not displace or force them out from their containers. On the contrary it presses merely on the diaphragm of the regulator device and, if the pressure of the air in any way fluctuates, opens or closes the valve *w*, throttling the pump and controlling the amount of water which is delivered into the regulator chamber and consequently the amount which can pass through the pipe *k* to the combustion chamber. A portion of the water also passes through the pipe *l* to the fuel container *b* and forces out the fuel. The entire structure and idea of the Davison patent is the *regulation* by the air pressure of the mechanically supplied water which, since the flow of fluid and water are interdependent, regulates the flow of both as a unit.

The Davison patent in suit is a development of the De Ferranti torpedo not only in its principle of using water, which it copies completely, but is a development and elaboration of the apparatus disclosed by De Ferranti. This will be particularly clear if we consider Mr. Davison's work preceding the filing of the application for the patent in suit.

Mr. Davison resigned from the Navy on Jan. 1, 1908, just after he had completed on behalf of the Government an extensive foreign trip to inspect

torpedo work abroad and he took with him the notes which he had made during that trip. (Finding III, p. 9.) Less than three months later, on March 19, 1908, he filed his application which resulted in patent 1,036,082, Exhibit C-15 (Finding XIV, p. 22. Addition to Record, p. 66). The apparatus of this patent bears a striking resemblance to the disclosure of the De Ferranti patent described above. See appellant's brief, pp. 68 and 84. It utilizes, just as is shown by De Ferranti, two pumps driven from the engine shaft, one for water and one for fuel (specification of the patent, p. 2, lines 103-106), the water pump taking its water from the sea (p. 2, lines 63-68), although it lacks the means of regulating the output of the pumps as described by De Ferranti (Addition to Record, p. 43). The patent in suit evidently represents an attempt to simplify and make more practical an apparatus of this character utilizing a pump.

In studying the specification of the patent in suit, we note that Davison never claims to have originated the idea of utilizing water in torpedo power plants. He states (record p. 25) that it would be a great advantage to utilize "a motive fluid derived by burning a suitable fluid with compressed air or oxygen and then injecting into the highly heated products of combustion a quantity of water whereby the water is converted into steam, adding to the volume of the fluid and increasing its temperature." He treats this as a well-known idea which it would be desirable

to utilize in practice "providing an apparatus can be devised which is of the requisite simplicity in construction and regulation so that it can be used without danger and with the assurance that it will be in operative condition whenever it is called upon to do its work." He then states definitely, "It is the object of the present invention to provide an apparatus suitable for that purpose," that is, his invention as he himself states is that of providing an apparatus for carrying out that purpose, and throughout the specification it is a fact which is emphasized that the essential points which he claims as novel and advantageous are *regulation* and *safety*, that is, in his own words again, an apparatus of "requisite simplicity in construction and regulation" and one which "may be used without danger."

The outstanding feature of Davison's design as contrasted with the earlier De Ferranti design is his "regulator" *u*, and through the claims he constantly speaks of the regulator which actually controls or regulates the amount of water which is supplied by the pump, governing it by the pressure of the low-pressure air. That is, the pressure of the low-pressure air is effective as a mathematical quantity. The air itself does not flow into liquid containing chambers as in the Government device to displace bodily the liquid therefrom but, because it is under pressure, it controls the diaphragm of the regulator chamber and controls the valve *w* which admits a greater or less amount of water from the pump. Such "regulation" is necessary

because the speed of the pump and its output may vary, although the air pressure remains constant and because it delivers an unsteady pulsating flow. De Ferranti provided for this by the by-passes described on page 43 of the Addition to Record. No means of controlling the pumps were present in Davison's earlier design. The one pump of the later design controlling the water in this manner also acts by displacing the fuel. That is, this single regulator controls the water and fuel supply as a unit as contrasted with the essentially independent systems in the Government torpedoes for displacing water and fuel separately, and because of this unitary control, which treats fuel supply and water supply as one, the air never comes into contact with the fuel and no explosive mixture can be formed in the fuel chamber *b*. This idea of the regulator, the thing which regulates or controls in accordance with the *numerical value of the pressure* of the air supply without bringing the air itself into contact with the fuel is emphasized again and again throughout the specification of the patent. Referring to the patent specification as reproduced in the record on page 27, we read as follows (*italics ours*):

With this construction and arrangement of parts the *pressure* of the oxygen carrier in the pipe *e* on the low-pressure side of the reducing valve *d* *controls* absolutely the pressure on the fuel and the pressure on the water supply to the generating chamber, so that the oxygen

carrier, the fuel, and the water are fed always at a predetermined pressure to the generating chamber, and if, for any reason, the supply of oxygen carrier is cut off or exhausted, the supply of fuel and water to the generating chamber will cease at once, while, as long as there is a supply of oxygen carrier under pressure and the flow of water into the regulator chamber is not interrupted, the supply of fuel and water to the generating chamber will continue under proper control. Furthermore, by this arrangement *the fuel in the fuel tank, as it is withdrawn, is replaced by water*, which, of course, remains at the bottom of the tank. *This prevents a possibility of the admission of air or oxygen into the fuel tank and the formation therein of an explosive mixture. But a single pump is necessary to feed both the fuel and the water, and it is made certain that the fuel and the water will be fed under the same pressure and will both be controlled by the pressure of the oxygen carrier. This dependence of the fuel supply upon the water supply, and their mutual dependence upon the single pump and the pressure of the oxygen carrier, is of further advantage in that it is impossible that the water supply should be stopped and the fuel supply continued, thereby creating unduly high temperatures in the generating chamber and engine. Furthermore, it will be observed, the arrangement is such, that if, for any reason, such as the breaking down of the water pump, the flow of water into the regulator chamber is interrupted, the supply of fuel will immediately cease, thus bringing the combustion to an end*

and preventing unduly high temperatures; but, nevertheless, the air or oxygen under pressure will continue to flow from the storage tank through the combustion chamber to the engine, and the torpedo will continue to be driven until the supply of oxygen carrier under pressure is exhausted.

Appellant has stated (brief, p. 32) that a primary feature of the Davison invention is that "the feed of the fuel and water is regulated in direct proportion to the rate of flow of air into the generator" and asserts the same (brief, p. 45) of the Government torpedo. *This assertion has no foundation in the record and we emphatically deny it.* In the Davison structure, where the water was pumped in by a mechanically driven pump independently of the air pressure and in a pulsating stream, regulation was necessary. The pump had to have a maximum discharge capacity at low speed and had to be throttled down to moderate capacity, especially after it had speeded up. The pulsations had to be smoothed out. No such necessity exists in the Government torpedo. The theory of this torpedo is not fully explained in the present record. To refute appellant's unwarranted statement, we must imitate it in going outside the record and assert that the differential in pressure which feeds the fuel and water does not vary directly with the pressure of the air, but in accordance with a complicated formula or function, and that the variation is of no practical importance. The record does show (Ex. III, p. 31) that the torpedo operates under

a uniform reducing-valve pressure. It follows that the differential is constant and that the rate of feed may be, and is, determined solely by the design of the exit openings into the combustion chamber (as described by Sodeau in his patent #835,262, Addition to Record following p. 47, folio 91, line 54), fixed once for all, and does not vary appreciably throughout the run of the torpedo. The finding of the court below of noninfringement as a fact includes the determination of this question.

DAVISON'S POSITION IN THE PRACTICAL ART.

Is there any reason why Davison's patent should be considered as more than what it appears to be on its face, a patent covering a detailed development of a specific form of apparatus entirely different from the form of apparatus utilized by the defendant? Was Davison in any way a pioneer in the practical development of the principles of water injection and did he teach the art how to apply practically the theoretical principles long previously disclosed by De Ferranti? The answer is emphatically "no." The apparatus designed by Davison was a practical failure and had no effect on the art at all. On July 26, 1910, when Commander Norton, the torpedo officer at the Bureau of Ordnance, visited the plaintiff's plant, the work was abandoned or suspended and he had to urge Davison to take it up *again*. (Finding VI, p. 11.) The first torpedo built by the plaintiff was not completed until October, 1912, and it was a failure and could not run as far as the old outside superheaters previously known. (Finding VIII, last

paragraph.) The converted Whitehead torpedoes were not completed until November, 1912, and these too were a practical failure. Long before this, as early as September 24, 1911, the Bliss torpedo, a "practical duplicate" of those complained of in this suit (Finding XIII, 3rd paragraph, p. 22) was at the Government testing range at Sag Harbor and had run substantially 10,000 yards. (Finding IX, last paragraph, p. 16.) In January, 1912, the Government was preparing contracts to purchase large numbers of these torpedoes. (Finding VIII, 3rd paragraph, p. 14.) It was more than a year after the successful demonstration of the Bliss torpedo before the plaintiff produced any torpedo. The experimental torpedo never came up to the minimum requirements. The converted Whiteheads were experimented with and experimented with until finally one on a single occasion limped across the 6,000-yard finish line. On September 27, 1913, the torpedo board considered what plaintiff had done and found: "The reliability of this form of steam generator has not been established * * *. There are grave doubts as to the practicability of this device as at present fitted for service use." (Finding XI, p. 21.) The demonstration is a demonstration of failure, not a demonstration of success. It is true that the Navy paid the pittance of \$3,000 for the work that had been done on the Whiteheads. But, if this charitable act be considered as a proof that the Davison steam generator was successful, it will nevertheless be seen that that

demonstration waited until long after the Bliss Company's torpedoes had become standard in the Navy.

The practical art owes nothing to Davison or the plaintiff, nor was the Bliss Company's success in any way based on what Mr. Davison had done. The plaintiff on p. 87 of his brief does not scruple to insinuate that Commander Norton violated professional confidence by disclosing to the Bliss Company principles which he had acquired from the Electric Boat Company. If the evidence below had not been to the contrary, the court would not have failed to find so important a fact. The charge is refuted by the facts of record. In 1908, when their attention was called to the article in the Brazilian publication, the Bliss Company stated that they had plans along the same line (Finding V, 2nd paragraph, p. 10) and in view of their close relation with Armstrong, Whitworth & Company, of which this court is aware, which concern owned the Sodeau patents, who can doubt what the plans were? However, the only time when Commander Norton could have acquired any knowledge from Davison was on July 26, 1910, when he visited the Electric Boat plant, but there was little to be learned from Mr. Davison at that time and he was not shown any physical devices. (Finding VI, p. 11.) Already in 1910 the Bureau of Ordnance had been receiving verbal information from the Bliss Company with reference to their experiments along the same line and the written records show that by October 14, 1910, the Bliss Company informed the Bureau of past experiments which indicated definitely

a doubling of horsepower obtainable from a flask full of air by means of water injection (Finding V, last two paragraphs, p. 11) and with great promptitude it built a practical torpedo on the basis of these disclosures. Could any oral information which Commander Norton could have gained at the Electric Boat Company's plant at the end of July have enabled the Bliss Company to construct an apparatus and complete a series of experiments by the first of October? Novel devices in torpedoes are not built overnight even by skilled workmen. The prompt production of a successfully operating torpedo by the Bliss Company indicates clearly that the principles were by no means new to that company. The radical difference between the form of apparatus used by the Bliss Company and that utilized by Davison demonstrates the entire independence of the Bliss Company's work. It was not the hurried result of pirated information obtained from the plaintiff who for all its alleged advantage as an originator in the art could not produce any torpedo at all until more than a year after the Bliss Company had succeeded and then produced one not fit for adoption and use.

That Davison was an original and hard-working inventor we do not attempt to deny. That the Electric Boat Company expended time and effort on the development of torpedoes, we do not attempt to deny. That they ever produced a practical torpedo we do deny and the record bears us out. De Ferranti published to the world the theory of the water torpedo. Sodeau had shown an apparatus

which could be utilized for carrying out the theory and the E. W. Bliss Company successfully embodied the Sodeau apparatus in actual metal in a torpedo, and this torpedo was performing as a torpedo operates in war time and in the open ocean before the Electric Boat Company and Mr. Davison had either completed a torpedo or placed one in the water.

THE SCOPE OF THE PATENT IN SUIT.

The Law of License Construction.

In any contract such as the present, wherein one party contracts to pay for the use of a certain thing, it must be shown that he has used it if he is to be held liable under his contract. In the present instance the defendant contends that what it contracted for was a specific thing, the "Steam Generator for Automobile Torpedoes," the device which was to be installed in the converted Whiteheads, and that this it has not used (*supra*, p. 62). It also contends that it can not be bound by the tenor of patent claims not in existence when the contract was executed and not considered by the parties. There could be no meeting of the minds of the parties on a definition not present in their minds (*supra*, p. 83). However, the defendant is further prepared to show that what it makes is not within the terms of the patent claims and that it is not bound, even if the contract in suit is considered as if it were an ordinary patent license entered into after the patent was granted and binding the defendant to pay for "the patented improvements."

In considering the contract from this view we should consider what rules control its construction. It is admitted that a licensee under a patent, at least in the ordinary case where he receives his license after the patent is granted and knows its tenor, can not, when sued for royalties, deny the validity of the patent. Does the estoppel extend any further? It will be convenient before discussing the adjudicated cases in detail to state the conclusion drawn from them by Walker in his standard work on patents. The references are to the fifth edition.

Estoppel by matter of deed may also arise in patent affairs. Where, for example, the alleged infringer has by contract admitted the validity of the patent and agreed not to infringe in the future, or where an assignor or grantor of a patent right, afterwards infringes the right which he conveyed, he is estopped by his conveyance from denying the plaintiff's title, or the validity of the patent, when sued for its infringement. (Section 469, p. 546.)

But such an assignor or grantor is not estopped, by his conveyance, from showing how narrowly the patent must be construed, except to the extent to which he may have made representations as to the scope of the patent as an inducement to the sale. He may not, however, introduce evidence ostensibly for that purpose, but which in fact tends to show that the patent is invalid. (Section 469, p. 548.)

And again Walker states:

As long as a licensee continues to enjoy the benefit of the exclusive right, he must pay the

royalty which he promised to pay, and he can not escape from so doing by offering to prove the patent to be void. (Section 307, p. 366.)

Wherever the licensor sues for the promised royalties, the defendant may introduce evidence of the prior art, to guide the court to the construction of the patent, and thus to aid in the ascertainment of the extent of those doings of the licensee which are subject to the payment of royalties. (Citing *Andrews v. Landers*, 72 Fed. 666; Section 309, p. 372.)

We have quoted from Walker both the rules which apply to an assignor of a patent who is sued thereafter for infringement by his assignee and those applying to a licensee who is sued for collection of royalties, as the legal situation of each is the same, and because the two cases have been treated as interchangeable by the courts, who cite either instance as a precedent for the decision in the other. This is amply clear, for example, from the decisions of the Circuit Court of Appeals in the Seventh Circuit, which in *Chicago & Alton Ry. Co. v. Pressed Steel Car Co.*, 243 Fed. 883, applied a rule of estoppel to a licensee on the authority of *Siemens-Halske Electric Co. v. Duncan Electric Mfg. Co.*, 142 Fed. 157, a case of an assignor. The Court of Appeals in the Second Circuit in *Pressed Steel Car Co. v. Union Pacific Ry. Co.*, 270 Fed. 518, in deciding a case involving a licensee, cited as precedents, without distinguishing among them, cases involving licensees, assignors, and defendants who had specifically covenanted to respect the validity of a patent. In the First Circuit in *Babcock*

v. *Clarkson*, 63 Fed. 607, the case of an assignor, the rule announced in the case of a licensee by the same Court in *Ball & Socket Fastener Co. v. Ball Glove Fastening Co.*, 58 Fed. 818, is quoted and adopted, and in a subsequent case involving an assignor, *Martin v. Hill Cash Carrier Co.*, 67 Fed. 786, both these cases are referred to without distinction as authority for the case of an assignor.

In the case at bar any disability under which the defendant may be must arise solely from the mere relation of licensor and licensee. There are no special circumstances which could give rise to any further estoppel. The Government does not deny the validity of the plaintiff's patent. It is content to admit that validity, merely stating that what it makes is an embodiment of the constructions of the prior art not comprehended within the scope thereof. The class of cases illustrated particularly by *Alvin v. Scharling*, 100 Fed. 87, holding that an assignor can not have a patent declared invalid by calling his contention to that end by another name and stating that he wishes to limit the scope of the patent is also to be distinguished. No such case arises here as the Government's contentions may be fully sustained and the patent will remain valid and of considerable scope covering the mechanisms disclosed and particularly pointed out by the specification as advantageous. Further to be distinguished is the line of cases illustrated by *United Printing Machinery Co. v. Cross*, 227 Fed. 600 (1915), C. C. A. First Circuit. There was a true estoppel *in pais*. In that case the assignor

when selling the patent made representations as to its scope which he could not thereafter be heard to deny. There is no such estoppel in the present instance. A still further class of cases is illustrated by *Pope v. Owsley*, 27 Fed. 100, C. C. N. D. Illinois (1886). In this case the parties by their past dealings under the license had interpreted the patent for themselves and having considered that certain constructions were within the terms of the patent were precluded thereafter from contending for a more restricted construction. This also differs from the case at bar wherein the Government has consistently and from the beginning denied that the contract has any relation to the structure which it makes. Between the plaintiff and the defendant in this case there is no relation except at most the bare relation of licensor and licensee. In fact the relation differs markedly from the usual one where the license is entered into on the basis of a patent already granted and known to both parties, since the patent in suit was not issued at the time the contract at bar was executed and the terms of the patent claims were entirely unknown to the Government at that time.

Admitting that a licensee or an assignor cannot set up the invalidity of the patent, it would seem obvious that the conclusions stated by Walker are correct and that unless bound in equity and in good conscience by his own acts to an actual estoppel *in pais*, he can offer any pertinent evidence including the state of the prior art to show what the patent actually is and what is its scope in order to show

that his acts which are complained of are not within the scope of the license. We submit that this is the true rule which is adhered to by seven of the eight Circuit Courts of Appeals which have passed on the question, and which is furthermore supported by statements of this Court. As the Courts in the Seventh Circuit, however, apply a peculiar rule of their own, repudiated by the Courts in the other Circuits, it is proper here to examine the cases in some detail.

The leading case on the subject was decided in 1900 by the Circuit Court of Appeals in the Sixth Circuit in *Noonan v. Chester Park Athletic Ass'n*, 99 Fed. 90. Judge Lurton, afterwards Mr. Justice Lurton of this Court, delivered the opinion which was concurred in by Judge Taft and Judge Day. The Court said (page 91):

It seems to be well settled that the assignor of a patent is estopped from saying his patent is void for want of novelty or utility, or because anticipated by prior inventions. But this estoppel, for manifest reasons, does not prevent him from denying infringement. To determine such an issue, it is admissible to show the state of the art involved, that the court may see what the thing was which was assigned, and thus determine the primary or secondary character of the patent assigned, and the extent to which the doctrine of equivalents may be invoked against an infringer. The court will not assume against an assignor, and in favor of his assignee, anything more than that the invention presented a sufficient degree of utility and novelty to justify the issu-

ance of the patent assigned, and will apply to the patent the same rule of construction, with this limitation, which would be applicable between the patentee and a stranger.

As we will later point out, this case has been consistently followed by the Courts of the Sixth Circuit and by all other Courts except that in the Seventh Circuit. In the Seventh Circuit in *Siemens-Halske Electric Co. v. Duncan Electric Mfg. Co.* (1905), 142 Fed. 157, a case involving a suit against an assignor, the Circuit Court of Appeals held that "between contracting parties extraneous evidence is inadmissible if there is no ambiguity or uncertainty in the language of the description and claims, and that, if there is uncertainty, outside evidence is admissible only to make clear what the applicant meant to claim and the Government to allow, and not for the purpose of showing, even in the slightest degree, that the applicant had no right to claim and that the Government was improvident in allowing what was in fact claimed and allowed."

On the authority of this case the same Court later extended this rule to the case of a licensee in *Chicago & Alton Ry. Co. v. Pressed Steel Car Co.* (1917), 243 Fed. 883.

The doctrine announced in the *Siemens-Halske* case was entirely novel. It ignored the directly contrary holding in the Northern District of Illinois in the same Circuit by Judge Seaman in *Western Telephone Construction Co. v. Stromberg* (1895), 66 Fed. 550. It finds no support in the authorities cited by

the Court. Of the United States cases referred to practically all sustain merely the admitted proposition that an assignor cannot deny validity. The *Harvey Steel* case, which is cited, is clearly not applicable as the discussion thereof in this brief has shown and is specifically distinguished from this class of case by the Court of Appeals for the Second Circuit in *Pressed Steel Car Co. v. Union Pacific Ry. Co.*, 270 Fed. 518 at 524. The holding of the Court apparently finds some support in the language of *Pope v. Owsley*, 27 Fed. 100, but this was a case wherein the scope of the patents had been defined by the parties for themselves by their past dealings and the holding of the Court went no further than to preclude the defendant from taking a position inconsistent with his past actions. The decision of the Circuit Court of Appeals for the First Circuit in *Babcock v. Clarkson*, 63 Fed. 607, which is relied upon, is in fact authority for the directly opposite proposition as will be clear from the decision of the Circuit Court below, affirmed by the Court of Appeals, which decision is reported in 58 Fed. 581, the lower Court construing the patented claims in view of no less than fourteen prior patents.

We will not attempt to analyze the English cases cited except to point out that they are clearly inapplicable because in the United States an individual is charged with knowledge of the contents of all prior patents and publications (*Derby v. Thompson*, 146 U. S. 476 at 481; *Mast Foss Co. v. Stover*, 177 U. S. 485, at 494), whereas in English law a distinction is

drawn between "mere public knowledge," which must be brought home to an individual by actual proof, and matters of "common general knowledge" with which the individual is charged and which must be proved by the evidence of witnesses cognizant of the state of knowledge or by reference to generally accepted and widely read text books or the like. See Fletcher Moulton on Patents, page 57. Under the English law the specifications of prior patents are not competent evidence of "common general knowledge" (*Mackie v. Solvo*, 10 R. P. C. 68 at 70; *Saccharin Corporation, Ltd., v. Chemical & Drugs Company, Ltd.*, 17 R. P. C. 28).

Appellant cites but three cases as in harmony with those of the Seventh Circuit. (Brief p. 55.) Two are directly contrary; the third has no application. In *Leader Plow Company v. Bridgewater Plow Company*, 237 F. 376, the court, after specifically approving the rule of the *Noonan case* (p. 377), said (p. 378):

With these principles in view the first inquiry is as to the difference between the patents acquired by the plaintiff and the prior art.

In *United States Frumentum Company v. Lauhoff*, 216 Fed. 611, no prior art was before the court (statement of facts p. 612), but the court (p. 613) quoted the rule of the *Noonan case* as the law. The third case, *United Printing Machinery Company v. Cross*, 227 Fed. 600, involved, as we have already pointed out, an actual estoppel *in pais*.

Subsequently to the *Siemens-Halske* case the Circuit Court of Appeals for the Sixth Circuit again considered the question and speaking again through Judge Lurton with whom sat Judges Severens and Warrington, in *Babcock & Wilcox Co. v. Toledo Boiler Works* (1909), 170 Fed. 81, reiterated their previous decision stating (page 84):

The estoppel is one limited in character, and such an assignor, when subsequently sued for infringing the assigned patent, may show the state of the art for the purpose of limiting its scope.

The conflict of authority was discussed exhaustively by Judge Rose, now Circuit Judge, in *Automatic Switch Co. v. Monitor Mfg. Co.*, 180 Fed. 983, a case arising in 1910 in the Circuit Court for Maryland. He emphasized the high authority of the judges in the Sixth Circuit who decided *Noonan v. Chester Park Athletic Association* and after discussing the *Siemens-Halske* case pointed out that after the decision thereof the Court in the Sixth Circuit in the *Babcock & Wilcox* case had adhered to its former ruling which was in harmony with the decisions of the Court of Appeals in the First Circuit. At this time the Court of Appeals in the Fourth Circuit had not as yet passed upon the question. Judge Rose repudiated the authority of the *Siemens-Halske* case and said in part (the quotation is from page 992):

There is nothing mysterious about the doctrine of estoppel. A man is estopped be-

cause in equity and good conscience he should not be allowed to say something, although that something may be true. Whether equity and good conscience require that he shall keep his mouth closed may and usually does in large part depend upon the special facts and circumstances. One who knew well the state of the art might sell a patent to one who knew nothing about it. In order to make the sale, he might read the claims to the buyer. He might comment on the breadth of their language. He might assert that he knew that they covered every possible machine by which the wished for result could be attained. Such a seller, I take it, when sued for the infringement of a patent he had sold, would not be permitted to set up the prior art for the purpose of showing that the patent was in fact a very narrow one; that it covered a limited class of machines only and that there were large classes of machines not covered by the patent which would accomplish substantially the same results. The circumstances under which a patent may be assigned may be quite different. An inventor may be in the employ of another. He may turn over his inventions to his employer, the employer may at his own expense prosecute applications for patents for such of these inventions as it may think valuable. When such employe subsequently changes his employment, there seems to be no reason why he should be any more estopped than any one else from showing that the patent he assigned, though valid, must be narrowly construed.

And Judge Rose concludes:

In any event, claim 8 must be construed as limited by the prior state of the art. So limited, it appears to me that the difference between the construction described in the patent and the devices made by the defendants are so substantial as to exempt the latter from the charge of infringement.

The *Siemens-Halske* case was also specifically discussed by Judge Thompson in the Eastern District of Pennsylvania in a case likewise arising before the Circuit Court of Appeals of that Circuit had passed upon the question, *Rollman Mfg. Co. v. Universal Hardware Works*, 207 Fed. 97. Judge Thompson likewise repudiated the *Siemens-Halske* case, stating on page 102:

If the *Siemens-Halske* case is to be construed as denying the right to introduce evidence of the prior art except to explain ambiguity or uncertainty in the claims, the weight of authority is undoubtedly in favor of the rule laid down by Mr. Justice Lurton in the case of *Noonan v. Chester Park Co.*

Neither of the District Court decisions which we have just referred to was appealed, but, as the citations which we will subsequently give will show, the Circuit Courts of Appeals in both the Fourth and Third Circuits in later decisions approved of the holdings in these cases and announced views in harmony with the *Noonan* case rather than the *Siemens-Halske* case.

We do not find that the Supreme Court of the United States has definitely and unequivocally passed upon this question. However, in the case of *Thorn Wire Co. v. Washburn & Moen Co.* (1895), 159 U. S. 423 at 449, Justice Shiras, speaking for the Court, said:

If the issue thus raised under the pleadings presented the question whether the Washburn and Moen Company should account for royalty received by it from the sale of Brinkerhoff barb fencing, because such fencing was an infringement of the Kelly patents and thus within the terms of the contract, it would be necessary for us to investigate the state of the art at the time the patents were granted as well as to compare the several claims of the respective patents, and our inspection of this record has not disclosed to us the materials necessary to enable us to do this intelligently.

More recently this present Court in the case of *Foley v. United States*, (1921) 260 U. S. 667, rendered a decision which does not lend itself to an exact quotation but which, after affirming the Court of Claims in holding that no contract existed, followed and approved the Court of Claims in its review of the claims of the patents in the light of the prior art, concluding that in view of that art the claims must be limited so that what the defendant, the Government, did was not within the scope of the patents (pp. 676-677).

The rule of *Noonan v. Chester Park Athletic Ass'n* has been definitely stated by the Circuit Courts of Appeals in the first, second, third, fourth, sixth,

eighth, and ninth circuits. No cases have arisen in the fifth circuit. We refer to some of the leading cases.

First Circuit.—The rule was applied by the Circuit Court of Appeals in the First Circuit in the case of a license in *Wright v. Fitz Bros.* (1904), 133 Fed. 394, Judge Aldrich, with whom sat Judge Putnam and Judge Brown, announcing the opinion of the Court, which concluded:

In view of this earlier patent, the substantial novelty of the two vertical holes in the Clark last is not in the holding function but in the function of spreading and lengthening. It results, therefore, that the Amos G. Fitz last does not violate the rights of the complainants under the license.

The rule in the case of an assignor is stated and applied in *Martin v. Hill Cash Carrier Co.* (1895), 67 Fed. 786. It is stated for a licensee in *Ball & Socket Fastener Co. v. Ball Glove Fastening Co.* (1893), 58 Fed. 818 at 820, 823, that case, however, being a peculiar one, in which a severe burden was placed upon the defendant since he occupied a truly fiduciary relation toward the plaintiff. As we have already pointed out, the more recent decision in this Circuit in *United Printing Machinery Co. v. Cross* (1915), 227 Fed. 600, involves an actual case of estoppel *in pais*, as the assignor in this case when he assigned the patent made representations as to its scope.

Second Circuit.—The rule in the Second Circuit was probably first stated by Judge Townsend in

Andrews v. Landers (1896), 72 Fed. 666, a case arising in the Circuit Court for Connecticut. Judge Townsend's opinion concludes (page 671):

As to the evidence offered to show the prior state of the art, I rule that the same is admissible, not to invalidate the Andrews patent but to explain the latent ambiguity in the language, "containing the patented improvement," and as bearing upon the situation of the parties and their object in making said contract.

Judge Townsend, then Circuit Judge, sitting with Judges Lacombe and Wallace, afterwards delivered the opinion of the Court of Appeals for the Second Circuit in *Western Electric Co. v. Robertson* (1905), 142 Fed. 471, a case of a suit against a licensee for the recovery of royalties. The Court considered in detail a prior patent to one Eaton and concluded its opinion as follows:

In interpreting the Robertson patent, we must read into it the limitations imposed by the disclosures of Eaton. A comparison of defendant's structure with that of Eaton shows that defendant has merely taken the Eaton structure with the wing or portion of a wall above the core tube and improved upon it.

We are of the opinion, therefore, that the construction of the patent in suit is determined, as a matter of law, by the limitations of the prior art, and that when thus interpreted its scope can not be extended to embrace the defendant's structure.

The rule has been consistently applied by the Circuit Court of Appeals from that time on, and the most recent decision stating it for the case of a licensee was rendered in 1920, *Pressed Steel Car Co. v. Union Pacific Ry. Co.*, 270 Fed. 518, numerous authorities in the Second Circuit and elsewhere being cited on pages 524 and 525.

Third Circuit.—Subsequently to the decision of Judge Thompson in *Rollman Mfg. Co. v. Universal Hardware Works* referred to above, the question came before the Circuit Court of Appeals in the Third Circuit in 1922 in *Piano Motors Corp. v. Motor Players Corp.*, 282 Fed. 435, a case of an assignor, this decision being in harmony with the Noonan case and contrary to the Siemens-Halske case.

Fourth Circuit.—In the Fourth Circuit also, subsequently to Judge Rose's decision above referred to, the Circuit Court of Appeals announced the rule in *Leader Plow Co. v. Bridgewater Plow Co.* (1916), 237 Fed. 376, a case of an assignor. The Siemens-Halske case is cited in the opinion but is not followed. On the contrary the rule of the Noonan case is upheld.

Fifth Circuit.—No cases appear to have arisen in the Fifth Circuit.

Sixth Circuit.—We have already pointed out that after the Siemens-Halske case the Circuit Court of Appeals in *Babcock & Wilcox Co. v. Toledo Boiler Works*, 170 Fed. 81, reiterated the doctrine of the Noonan case, and this rule has been consistently followed in the Sixth Circuit, the latest decision being

in 1914 in *Schiebel Toy & Novelty Co. v. Clark*, 217 Fed. 760.

Eighth Circuit.—*Moon-Hopkins Co. v. Dalton Adding Machine Co.* (1916), 236 Fed. 936, a case of an assignor, agrees with the majority rule as announced in the Noonan case.

Ninth Circuit.—*Leather Grille & Drapery Co. v. Christopherson* (1910), 182 Fed. 817, another case of an assignor, while citing the Siemens-Halske case, follows the majority rule of the Noonan case.

The Supreme Court of Massachusetts also lends its authority to the majority rule, Judge Hammond rendering the opinion of the Court in 1906 in *Aberthaw Construction Co. v. Ransome*, 192 Mass. 434.

It will be seen that, in addition to the Supreme Court's expressed attitude on the subject, the question has been specifically considered by eight of the nine Circuit Courts of Appeals, that seven definitely hold that the prior art is pertinent and admissible and that six of these seven Courts have specifically considered the question subsequent to the Siemens-Halske case, and decided contrary to that case, in the Second Circuit as recently as 1920, in the Third Circuit in 1922, in the Fourth Circuit in 1916, in the Sixth Circuit in 1909 and in other cases up to 1914, in the Eighth Circuit in 1916, and in the Ninth Circuit in 1910. The overwhelming authority is in favor of the rule that a licensee, while estopped to deny validity of the licensor's claim to the subject of the license, is always permitted to define that subject by reference to the prior art, except where by reason

of the circumstances of the case a special estoppel is created. In the present case the findings negative the existence of any circumstances which might modify the rule.

It is believed, furthermore, that the case at bar comes even within the strict rule of the Seventh Circuit, but it is submitted that the rule of the Seventh Circuit should really not be considered a rule, and finds no true application except perhaps in certain cases readily accounted for by their specific facts. It is questionable whether any patent can be adequately understood without reference to the prior art. A patent has no existence and has no meaning except in the setting of that prior art, and it is questionable whether any judicial tribunal can have an adequate or proper understanding of a patent document unless it accepts all possible aids afforded by a study of the art.

It is conceivable that a patent claim might be so perspicuous in its language and so absolutely definite that if it existed at the time of the contract and was present in the minds of the parties, it would be impossible to say that either party could have understood it in any but one way, and that way the Court would enforce. That is not the case at bar, where the claims are as vague and involved as any patent claims could be. It is not the case at bar, because the claims were not known to the parties when they wrote the contract.

It is also possible that in a given instance the physical structures of the plaintiff and the defendant may be such practical duplicates that to talk of the terms

of the claims is unnecessary. The structures may speak for themselves and show that the defendant's structure is the patented structure. That was the fact in the *Chicago & Alton* case above referred to. It is not the case at bar, where the structures are entirely different on their face.

It is respectfully submitted that a plaintiff can never say, "Here is the claim of my patent, and I interpret it to mean so and so and understanding it in this way, read it upon the defendant's structure, and the Court must accede to this interpretation, and can not look beyond it to determine whether it is correct." We do not believe that the Court of Appeals of the Seventh Circuit wished to emulate the learned Justice of the Peace who stopped defendant's counsel, and said that he did not wish to hear the other side of the case because "it confused the Court."

In the next division of this brief we shall analyze the claims on which plaintiff relies in the light of his specification and show that the reasonable interpretation of them does not cover anything that plaintiff does. In the light of the rule of the overwhelming majority of Circuit Courts of Appeals, and the rule which this Court, in *Thorn Wire Co. v. Washburn & Moen Co.* 159 U. S. 423 at 449, said it would be necessary to follow if the question were before it, such an interpretation and evaluation of the scope of plaintiff's claims is absolutely obligatory because any broadening of their scope to include the defendant's structure broadens them to include the Sodeau disclosures of the prior art anterior to Davison's invention.

The terms of the patent claims do not include defendant's device.

From general considerations it is clear that since the Sodeau British patent was a printed publication and a part of the prior art before any conception by Davison of the device shown in his patent, and since the Government torpedo as built by the E. W. Bliss Company is the device of the Sodeau patent, the possible extent of the novel invention which could be secured to Davison by a patent under our laws did not include the present Government torpedo. Apart from this, however, if the specification and claims of the patent in suit are carefully but fairly read, it clearly appears that the invention set forth in the patent and covered by the claims has for its essence the use of a single *regulated* pump acting on both water and fuel as a unit in place of the two separate unregulated pumps of De Ferranti or of Davison's patent 1,036,082 based on his earlier application and the idea of using the *pressure* of the air to regulate or control the feed of the water and fuel by the pump instead of utilizing the air as a displacing fluid. These ideas are emphasized by the words of the claims and in fact the words of these claims cannot be applied literally to the Government's torpedo.

If we examine the patent in suit as reproduced beginning on page 25 of the record, we find that the patentee after referring to the advantages of the use of water, which advantages were well understood in the art, states that "it is the object of the present invention to provide an apparatus" and an

apparatus "of the requisite simplicity in construction and regulation" and one which "may be used without danger." Without any further characterization of the apparatus the specification then proceeds to a detailed description of the drawings and after this has been completed it continues on page 27 of the record to point out the characteristics of the device which has been described. We find the following statements (*italics ours*):

But a *single pump* is necessary to feed both the fuel and the water and it is made certain that the fuel and the water will be fed under the same pressure and will both be controlled by the pressure of the oxygen carrier. This *dependence of the fuel supply upon the water supply, and their mutual dependence upon the single pump* and the pressure of the oxygen carrier, is of further advantage in that it is *impossible that the water supply should be stopped and the fuel supply continued*, thereby creating unduly high temperatures in the generating chamber and engine.

If, for any reason, such as the breaking down of the water pump, the flow of water into the regulator chamber is interrupted, the supply of fuel will immediately cease.

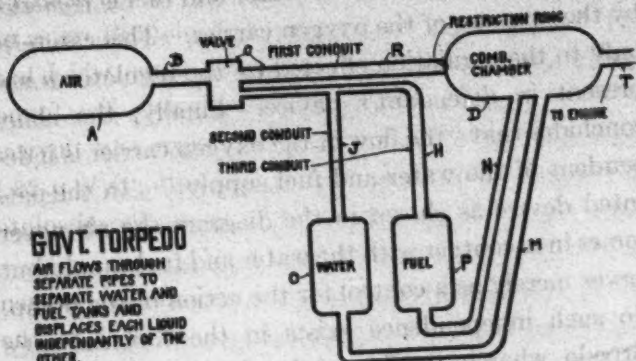
This (the construction) *prevents a possibility of the admission of air or oxygen into the fuel tank* and the formation therein of an explosive mixture.

With this construction and arrangement of parts the *pressure* of the oxygen carrier in the pipe *e* on the low pressure side of the reducing valve *d* *controls* absolutely the pressure on

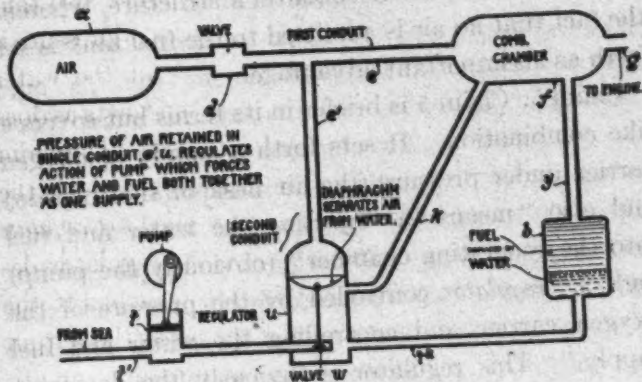
the fuel and the pressure on the water supply to the generating chamber.

This characterization of the essence of the patent is carried over into the claims. The plaintiff relies on Claims 1, 5, and 13, and the Court of Claims, which had the advantage of the fuller record below, has found that the Government does not utilize any devices within the terms of these claims. (Finding XV, p. 22.) A careful reading of these claims shows the absolute correctness of the Court's finding.

Claim 1. This claim calls for a tank for an oxygen carrier under pressure (the ordinary air flask of the torpedo) and "an auxiliary source of pressure for the water and fuel supply." This latter is obviously the pump and in the defendant's torpedo there is but one source of pressure, the air flask. We notice also that the claim says that this auxiliary source of pressure is "for the water and fuel *supply*," not for the water and fuel *supplies* in the plural; that is, it acts as does the pump on both water and fuel as a unit. The claim then calls for "a second conduit through which the *pressure* of the oxygen carrier is applied to *regulate* the pressure of the fuel." This is the regulator device *u* which by means of the valve *w* attached to the diaphragm actually controls and regulates the output of the pump in accordance with the pressure, quantitatively considered, of the air. In the defendant's torpedo the air is under pressure but its pressure as such is not a factor. The air enters as a displacing fluid, comes in contact with the water and fuel and crowds them out of the containing tanks. It operates



PATENT IN SUIT



on each separately and the supply of water might fail while the supply of fuel might continue. The claim then states that the flow of water and fuel is *regulated* by the pressure of the oxygen carrier. This can refer only to the regulation effected by the regulator *u* not present in defendant's device. Finally, the claim concludes that "the flow of the oxygen carrier is independent of the water and fuel supply." In the patented device as shown in the diagram the air never comes into contact with the water and fuel supply but serves merely as a control for the action of the pump. No such independence exists in the Government's torpedo, wherein the flow of the air into the water and fuel containing tanks causes the supply of these fluids, and the air comes directly in contact with the fuel as distinguished from the plaintiff's structure, wherein the fact that no air is admitted to the fuel tank is set forth as an important advantage.

Claim 5. Claim 5 is briefer in its terms but covers a like combination. It sets forth a supply of oxygen carrier under pressure (the air flask of the torpedo) and also "means for injecting the water and fuel into the generating chamber" (obviously the pump) and a "*regulator* controlled by the pressure of the oxygen carrier and controlling the water and fuel supply." This regulator is obviously the device *u*, so called throughout the specification of the patent and not present in the defendant's torpedo. In the defendant's torpedo there are no separate means for injecting the water and fuel, but the low-pressure air

flows to the combustion chamber and to the fuel-containing tanks without any regulation or control. The essence of this claim is obviously the provision of such means as a pump, the "single pump" referred to in the specification, and the regulator which controls or governs the action of this pump.

Claim 13. Claim 13 likewise covers the regulator which is the characteristic feature of the patent in suit. This is expressed by the language "a second conduit likewise controlled by the valve (that is, it is on the outlet side of the main reducing valve of the torpedo) and through which the pressure of the oxygen carrier is applied to the fuel and water supply * * * whereby the water and fuel feed to the generator depends at all times upon the pressure of the oxygen-carrier." The conduit referred to is obviously the control or regulator device *u* and its connecting pipe *e'*, not merely a piece of pipe as that would leave the claim fatally incomplete and unintelligible. It is "a second conduit," that is, one device, and it applies "the pressure" of the air to "the water and fuel supply," that is, to the water and fuel supply as a unit. The water is pumped in from the ocean and displaces the fuel before it. The regulator device by means of the valve *w* opens or closes the outlet from the pump which supplies the water in accordance with the value of the pressure of the air and in so doing it controls as one unit the supply of water and fuel and thus this supply will at all times depend on and be governed by "the pressure of the oxygen carrier."

No such structure is present in the Government torpedo. There is no device which corresponds to the regulator of the patent and which governs as a unit the feed of water and fuel in accordance with the pressure of the air. The air passing from the main reducing valve flows into the water and fuel tanks and displaces the liquids therefrom. There is a water supply and a fuel supply. There is nothing which corresponds to the "second conduit" of the claim. Even if we understood "conduit" to mean no more than a pipe, the claim does not read upon the Government torpedo. In the Government torpedo there is a *second* pipe or conduit leading to the water tank, *vi.*, passage through the pipes G and J, and a *third* pipe or conduit leading to the fuel tank, *viz.*, a passage through the pipes G and H, and while these passages are merged together for a portion of their length in the pipe G they are functionally entirely separate passages and through one, G, J, the air is admitted to the water tank as a unit of supply and through the other, G, H, to the fuel tank as an independent unit of supply. If either of the pipes J or M were stopped up, the water supply would cease but the fuel supply would continue. There is no mutual dependence of the two upon a single source of pressure governed by the air supply.

If we were to attempt to apply the literal words of patent Claim 13 to the defendant's torpedo it would

be necessary to change it at least in the following manner as indicated by italics:

In apparatus for generating motive fluid for automobile torpedoes, a generating chamber D in which an oxygen carrier and fuel are burned and the products of combustion mixed with water vapor, a tank A for the oxygen carrier under pressure, a conduit B-R including a control valve C through which the oxygen carrier may pass to the generating chamber, a water supply O (but note in passing in what a different sense this word is used as the Government's supply is a tank of water and the patentee's supply is a device for pumping in water from the ocean), a fuel supply P, a *second conduit or pipe G-H and a third conduit or pipe G-J* likewise controlled by said valve and through which, *respectively*, the oxygen carrier is *delivered into contact with the fuel supply in P and the water supply in D*, and conduits N and M through which the fuel and water may freely pass as *displaced by the oxygen carrier* into the generating chamber, whereby the water and fuel feed depends at all times *upon the displacement effected by the volumes of oxygen carrier admitted to the containers.*

The thirteenth claim of plaintiff's patent does not in its terms read upon the defendant's structure. It is plain from the specification of the patent and from the other claims what the mechanism referred to by the words of the claim is, the *regulating* device, not present in the defendant's torpedo. (See also p. 124 above.)

This is not an emasculating construction of the claims or one which strikes down the plaintiff's patent and leaves it invalid. It leaves the claim and the patent covering a presumably valuable improvement embodying advantages emphasized by Davison in the specification, the use of a *single pump* or source of pressure independent of the low-pressure air for feeding water and fuel as a unit *without air coming into contact with the fuel* and the *regulation* or control of this pump or like device in accordance with any fluctuations in the *pressure* of the air supply.

There is no reason why the claims of plaintiff's patent should mean anything more than they say. Davison taught the art nothing new, his apparatus was a practical failure and reached even the stage of failure only long after the defendant's torpedo now complained of was a demonstrated success. He was anticipated in the theoretical art by Sodeau and his patents, and in the practical art he was long anticipated by the E. W. Bliss Company, which constructed the device of the Sodeau patents. On both grounds his claims must be limited and understood for what they clearly appear to state on their face, a device different from the Government torpedo which is the construction of the Sodeau patent published long before Davison's invention, embodying solely features of construction which the world learned from Sodeau and embodying none of the characteristic elements of the patented construction.

CONCLUSION.

1. As the Court below, after considering full and contentious evidence concerning the complicated subject matter, has found as a fact that the defendant does not use plaintiff's device, there is no possible error of law in the conclusion that plaintiff cannot recover.

2. The contract relates only to a specific device, Davison's "Steam Generator" as known by that peculiar name and as represented in the drawing alone considered by the parties in making the contract, and does not comprehend the widely different device previously given to the Government by the E. W. Bliss Company.

3. The scope of the contract, so far as based on the pending patent application, the tenor of which was unknown to the defendant and not considered by the parties, is determined by the actual novelty of that application and not by the terms of a claim granted later.

4. The patent and the terms of its claims do not cover defendant's device.

Respectfully submitted.

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